FARGO

Persona® C11 Card Printer and Persona® M11 Card Printer User Guide (Rev. 4.0)

Part Number: L000701

Persona® C11 Card Printer and Persona® M11 Card Printer User Guide (Rev. 4.0), property of FARGO Electronics, Incorporated

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The revision number for this document will be updated to reflect changes, corrections, updates, and enhancements to this document.

Revision Control Number	**Date**	**Document Title**
Revision 4.0	15 September 2003	Persona® C11 Card Printer and Persona® M11 Card Printer User Guide (Rev. 4.0)

These reference documents were thoroughly reviewed to provide FARGO with professional and international standards, requirements, guidelines, and models for our technical, training, and user documentation. At all times, the *Copyright Protection Notice* for each document was adhered to within our FARGO documentation process. This reference to other documents does not imply that FARGO is an ISO-certified company at this time.

- ANSI/ISO/ASQ Q9001-2000 American National Standard, (sub-title) Quality Management Systems - Requirements (published by the American Society of Quality, Quality Press, P.O. Box 3005, Milwaukee, Wisconsin 53201-3005)
- The ASQ ISO 9000:2000 Handbook (editors, Charles A. Cianfrani, Joseph J. Tsiakals, and John E. West; Second Edition; published by the American Society of Quality, Quality Press, 600 N. Plankinton Avenue, Milwaukee, Wisconsin 53203)
- Juran's Quality Handbook (editors, Joseph M. Juran and A. Blanton Godfrey; Fifth Edition, McGraw-Hill)

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How to use the manual

The Persona® C11 Card Printer and Persona® M11 Card Printer User Guide (Rev. 4.0) is, in fact, the troubleshooting and field service manual for the entire card Printer. The manual is designed to provide Installers and Technicians with quick, efficient lookup of related procedures, components, and terms. The manual can be used effectively either in soft or hard copy, depending on the preference of the Installer or Technician.

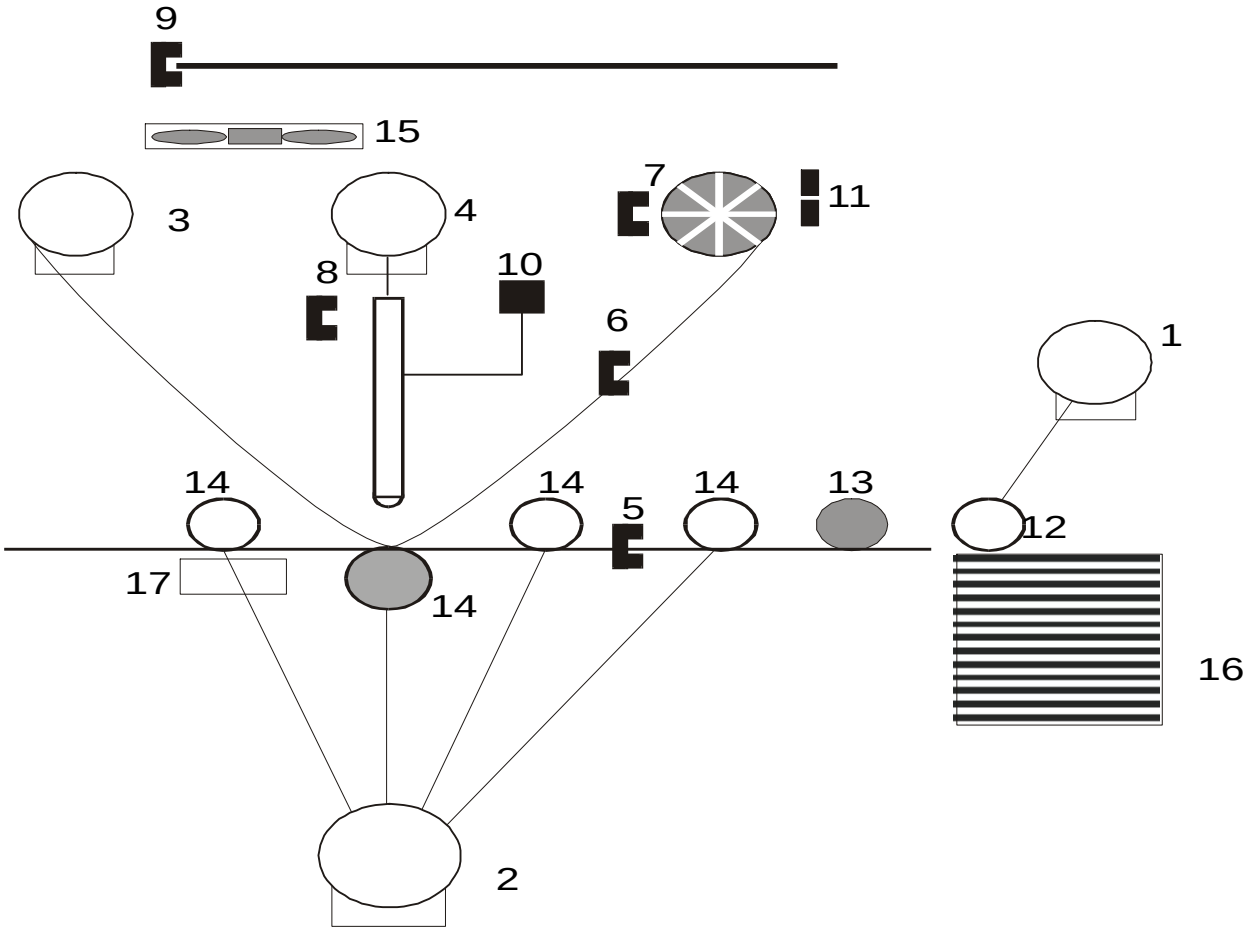
Manual	**Description**
Sequence of Operations, Glossary of Terms, and Technical/Functional Specifications (hyper-linked)	You can go directly to the Sequence of Operations, Glossary of Terms, Technical Specifications, and Functional Specifications to learn how to use the processes, procedures, functions, and windows for the card Printer within concise, correlative tables.
Table of Contents (hyper-linked)	You can use the automated Table of Contents to quickly locate, for example, an error message, a procedure, the index, or an appendix.
Troubleshooting, Replacement, Removal, Diagnostic, and Navigation Procedures (in hyper-linked Sections)	You can go directly to Specifications, General Troubleshooting, Printer Adjustments, Parts Replacement, Printer Packing, Board Level Diagnostics, LCD On-Line Menu Navigation, and Firmware Updates to find troubleshooting, removal, and replacement procedures. The section titles are always labeled according to their function for consistent usage.
Cross-Referencing (hyper-linked)	You can use the cross-referencing links to quickly locate, for example, an error message or a procedure.
Comprehensive Index (hyper-linked)	You can use the COMPREHENSIVE INDEX to quickly locate information on the card Printer, relating to a specification, a procedural step, a window or screen, a component, a term, a qualifier, or a related feature to this Printer.
Appendices	You can use Appendix A and B to locate information relating to engineering drawings and technical updates, which are specific to the card Printer.

Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger:	**Failure to follow these installation guidelines can result in death or serious injury.** Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair procedures, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these procedures.
Caution:	**This device is electrostatically sensitive. It may be damaged if exposed to static electricity discharges.** Information that raises potential electrostatic safety issues is indicated by a warning symbol (as shown to the below). • **To prevent equipment or media damage**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent equipment or media damage**, observe all established Electrostatic Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. • **To prevent equipment or media damage**, always wear an appropriate personal grounding device (e.g., a high quality wrist strap grounded to avoid potential damage). • **To prevent equipment or media damage**, always remove the Ribbon and Cards from the Printer before making any repairs, unless otherwise specified. • **To prevent equipment or media damage**, take jewelry off of fingers and hands, as well as thoroughly clean hands to remove oil and debris before working on the Printer.

Persona® C11/M11 Card Printer Overview

Reviewing the Persona® C11/M11 Block Diagram



Motors	
1	Card Feed
2	Print Stepper
3	Ribbon Drive
4	Print Headlift

Sensors	
5	Card Feed
6	Ribbon Sensor
7	Ribbon Encoder
8	Headlift
9	Cover Interlock
10	Printhead Thermistor
11	Ribbon ID

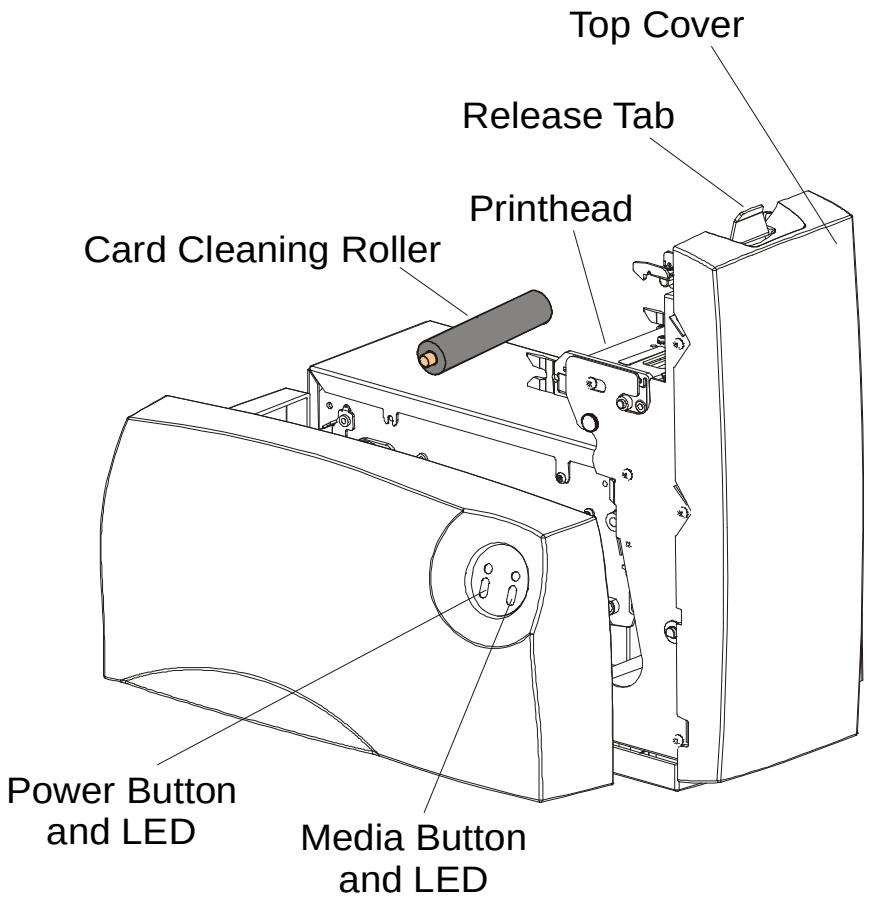
Parts	
12	Card Input Roller
13	Cleaning Roller
14	Card Feed Roller
15	Printhead Cooling Fan
16	Card Input Hopper
17	Magnetic Encoding Head

Reviewing the Persona® C11/M11 Sequence of Operations

The following sequence describes a full color print job with magnetic encoding.

Step	Process
1	The File information is received from the PC
2	Printer checks the installed Ribbon type stored in memory against the Ribbon type command that was sent from the Printer. a. If Ribbon type does not match, the media light will begin flashing.
3	The Card Input Motor and print Stepper Motor engage.
4	The Card Feed Sensor detects leading edge of card and disengages the card input Motor.

Continued on the next page



Reviewing the Persona® C11/M11 Sequence of Operations (continued)

Step	Process
5	The Print Ribbon drive engages.
6	The Print Ribbon Sensor looks for the color transition from Yellow to Magenta. Print Ribbon Encoder detects number of revolutions required to use an entire color panel.
7	The Print Stepper Motor engages.
8	The Card Feed Sensor detects trailing edge of card.
9	The Print Stepper Motor queues card to the middle of the platen roller. All Stop
10	The Print Headlift Motor engages.
11	The Print Headlift Sensor detects closed state.
12	The Print Headlift Motor disengages.
13	The Print Stepper Motor engages.
14	The Print Cover Sensor checks for a closed state.
15	The Ribbon drive Motor engages.
16	The Image data is burned by the Printhead until image data is depleted. All Stop.
17	The Thermistor engages Printhead Cooling Fan to maintain proper operating temperature.
18	The Headlift Motor engages.
19	The Print Headlift Sensor detects an open state.
20	The Print Headlift Motor disengages.
21	The Print Stepper Motor engages.

Continued on the next page

Reviewing the Persona® C11/M11 Sequence of Operations (continued)

Step	Process
22	The Print Ribbon drive engages.
23	After Ribbon advances a few encoder clicks, assume Ribbon free of card. All Stop.
24	Repeat steps 9 through 23 for appropriate number of color/overlay panels.
25	The Card Feed Stepper Motor engages to queue card for magnetic encoding.
26	The Encoding data is written to the card.
27	The Card Feed Stepper will requeue card for each verification pass required.
28	The Card is ejected from the Printer.
29	All Stop

Reviewing the Persona® C11/M11 Boot up Sequence

Step	Process
1	On Power up, the Printer checks the current state of the Card Feed Sensor and the Headlift Sensor.
2	If the Headlift Sensor is found to be open, the Headlift Motor will turn until a closed state is seen.
3	If the Card Feed Sensor is found to be blocked, the Card Feed Stepper will engage to eject the card.

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Section 1: Specifications

The purpose of this section is to provide the User with specific information on the Regulatory Compliances, Agency Listings, Technical Specifications and Functional Specifications for the Persona® C11 Card Printer and Persona® M11 Card Printer User Guide (Rev. 5.0).

Regulatory Compliances

Term	Description
CSA	The Printer manufacturer has been authorized by UL to represent the Card Printer as CSA Certified under CSA Standard 22.2. **File Number:** E145118
FCC	The Card Printer complies with the requirements in Part 15 of the FCC rules for a Class B digital device. (**Note:** These requirements are designed to provide reasonable protection against harmful interference in a residential installation.) If equipment operation in a residential area causes unacceptable interference to radio and TV reception, the operator is required to take whatever steps are necessary to correct the interference.
ITS-EMC	The Card Printer has been tested and complies with EN55022 Class B: 1995 and EN82082-1: 1997 standards for EMI emissions. (**Note:** Based on the above testing, the Printer manufacturer certifies that the Card Printer complies with all current EMC directives of the European Community and has placed the CE mark on the Card Printer.) **License Number:** J99032510
TÜV-GS	The Card Printer has been tested and complies with IEC950 and bears the TÜV-GS mark. **License Number:** S9971826
UL	The Card Printer is listed under UL 1950 INFORMATION TECHNOLOGY EQUIPMENT. **File Number:** E145118, Volume 1, Section 15

Agency Listings

Term	Description
Emissions Standards	CE, FCC, CRC c1374, BSMI, ITS (EN 55022 Class B:1995, FCC Class B, EN 82082-1:1997).
Safety Standards	UL 1950, CSA C2.2 No.950-95 and TüV-GS (EN 60950 A1-A4, A11).

Technical Specifications

Type	Description
Accepted Standard Card Sizes	CR-80 (3.375” L x 2.125” W/85.6mm L x 54mm W)
Accepted Card Thickness	30 mil (.030"/.76mm)
Accepted Card Types	PVC or polyester cards with polished PVC finish; monochrome resin required for straight polyester
Agency Listings	Safety: UL 1950, CSA C2.2 and TüV-GS (IEC-950) Emissions: FCC Class A, CRC c1374, Class A and TüV-EMC (IEC-801 -2, -3, -4; CISPR 22, Class B), CE, BSMI
Card Input Hopper Capacity	45 cards (30 mil)
Colors	**C11:** Up to 16.7 million M11: Monochrome
Dimensions	6.7” H x 13.1” W x 10.5"D/170mm H x 333mm W x 267mmD
Humidity	20-80% non-condensing
Interface	8-bit Centronics-type parallel (ECP-compatible)
Memory	2MB RAM
Operating Temperature	65° to 80° F/18° to 27° C
Print Area	**C11:** CR-80 edge-to-edge M11: 3.31” L x 2.02” W/84mm L x 51mm W
Printer Drivers	Windows 95, Windows 98, Windows Millennium, Windows NT 4.0, Windows 2000

Continued on the next page

Technical Specifications (continued)

Type	Description
Print Method	• **C11:** Dye-Sublimation/Resin Thermal Transfer • **M11:** Resin Thermal Transfer
Print Speed	• **C11:** 30 seconds per card/120 cards per hour (YMCKO) • **M11:** 5 seconds per card/720 cards per hour (K) (**Note:** Indicates the print ribbon type and the number of ribbon panels printed where Y=Yellow, M=Magenta, C=Cyan, K=Resin Black, B=Dye-Sublimation Black and O=Overlay.) • Print speed is measured from the time a card feeds into the Printer to the time it ejects from the Printer. • Print speeds do not include the time needed for the PC to process the image. • Process time is dependent on the size of the file, the CPU, amount of RAM and the amount of available resources at the time of the print.
Resolution	300 dpi (11.8 dots/mm)
Supply Voltage	100-240 VAC, .6-1.3 A
Supply Frequency	50 Hz/60 Hz
System Requirements	IBM-PC or compatible, Windows 95/98, Windows NT 4.0 or Windows 2000, Pentium™ class 133 MHz computer with 32 MB of RAM or higher, 200 MB free hard disk space or higher, ECP parallel port with DMA access
Weight	15 lbs./7 kg

Visual Security Solutions (Specifications)

VeriMarkTM Cards - 2-D holographic foil application

VeriMarkTM Cards are a low cost, customized 2-D holographic foil application, that is made in two steps.

- The first step is to emboss a base foil 1.9 cm (L) x 1.3 cm (H) onto the surface of a blank white card.
- The second step is debossing a custom made dye into the surface of the base foil - leaving a customized image, logo or text provided by the customer.
- Two separate color foils are used to contrast the impression.

End Users will be able to choose between 8 different card placements (4 - landscape) and (4-portrait) where the VeriMarkTM can be located. When its time to print through the driver, the End User will select the location on their organizations card design around which no printing and overlay will be placed.

Custom HoloMarkTM Cards

A Custom HoloMark TM Card is a three-dimensional holographic image transferred to metal foil and embossed to blank cards. The image is customer specific and the program mirrors our holographic laminates program with a couple exceptions.

Visual Security - Card Stock Part Numbers

All Visual Security Cards will be offered on the following Fargo Card Stocks only:

- P/N# 81754 Ultra Card
- P/N# 81762 Ultra Card III with hi-coercivity magnetic stripe
- P/N# 81763 Ultra Card III

Visual Security - Fargo Certified Overlaminates (Special Order in 50 quantity minimum)

- Part No. 82255: PolyGuard 1.0 mil for HoloMarkTM and VeriMarkTM Cards, Clear
- Part No. 82256: PolyGuard 1.0 mil for HoloMarkTM and VeriMarkTM Cards, High Resolution Globe design hologram with "Secure" micro-text

Visual Security Card Stock - Tolerances

- Tolerance of base foil placement will equal +/- .010" from the nearest edges of the card
- Tolerance of layered foil will equal +/- .010"

VeriMarkTM - Application Specifications

VeriMarkTM foils will cover a dimensional area of 1.9 cm length x 1.3 cm height. The exclusive areas are as follows:

- VeriMarkTM Card customers will be able to choose 1 of 8 pre-defined placements (corners) via printer driver (4 positions) Landscape and (4 Positions) Portrait mode.
- VeriMarkTM foil placement will not interfere with card punch slots .
- Foil color base is silver; debossed impression is gold foil.
- VeriMarkTM foil placement will be located 0.4 cm from the edges of the card except for the top two locations on portrait orientation cards (positions E & F). The foil will be located 0.9 cm from the top of the card and 0.4 cm from the sides of the card.

HoloMarkTM and Custom HoloMarkTM - Application Specifications

HoloMarkTM and Custom HoloMarkTM foils will cover a dimensional area of 1.5 cm x 1.5 cm. The exclusive areas are as follows:

- HoloMarkTM and Custom HoloMarkTM card end-users will be able to choose 1 of 8 pre-defined placements (corners) via printer driver (4 positions) Landscape and (4 positions) Portrait mode.
- HoloMarkTM foil placement will not interfere with card punch slots.
- Foil Color options will be silver or gold.
- Outside edge placement of Foil impression options on card will be 0.4 cm from edge of card.
- HoloMarkTM foil placement options will be at all four corners of card located 0.4 cm from edge of card.

Functional Specifications

This Card Printer utilizes two different, yet closely related printing technologies to achieve its remarkable direct-to-card print quality for dye-sublimation and resin thermal transfer. The Card Printer will print from any IBM-PC® or compatible running Windows® 95/98/Me, Windows NT 4.0, Windows 2000 or Windows XP.

The following describes how each of these technologies works:

Function	Description
Dye-Sublimation	Dye-Sublimation is the print method the C11 uses to produce smooth, continuous-tone images that look truly photographic. (**Note:** This process uses a dye-based ribbon roll that is partitioned by a number of consecutive color panels.) • The panels are grouped in a repeating series of these three process colors along the entire length of the print ribbon: yellow, magenta and cyan or YMC. • The Printer always prints the yellow panel first, followed by the magenta panel and the cyan panel. (**Note:** As the print ribbon passes beneath the Printhead, hundreds of thermal elements within the Printhead heat the dyes on the ribbon. When these dyes are heated, they diffuse into the surface of the card. A separate pass is made for each of the three color panels on the ribbon.) By combining the colors of each panel and by varying the heat used to transfer these colors, it is possible to print up to 16.7 million different shades of color. (**Note:** This blends one color smoothly into the next, producing photo-quality images with absolutely no dot pattern.)
Resin Thermal Transfer	Resin Thermal Transfer is the print method the Printer uses to print sharp black text and crisp bar codes, which can be read by both infrared and visible-light bar code scanners. • Used to print ultra-fast, one-color ID cards on the C11 or M11. (**Note:** Like dye-sublimation, this process uses the same thermal Printhead to transfer color to a card from a resin-only print ribbon or the resin black (K) panel of a full color print ribbon.) • Solid dots of resin-based ink are transferred and fused to the surface of the card. (**Note:** This produces durable, saturated printing.)

Printer Components: Top Cover to Parallel Interface Card

Components	Description
Top Cover	Opens to allow access to the Printhead, print ribbon and card path. (**Note:** This cover must be closed in order for the Printer to begin printing.)
Release tab	Unlatches the Top Cover.
Printhead	The component of the Printer that actually does the printing. (**Note:** This component is fragile and must not be bumped or touched with anything other than a cleaning pen.)
Power button and LED	The Power button ⏻ turns the Printer ON and OFF. (**Note:** It also serves to cancel the current print job and reset the Printer for the next print job.) If a card is left within the Printer after a print job is canceled, it will automatically be ejected when the Printer is turned back ON.
Media button and LED	The Media button is used to pause the Printer during normal operation and also to resume operation after an error condition is cleared. (**Note:** In general, as the icon above this button indicates, errors are related to either the ribbon or the cards. If an error occurs, the Media LED will flash.) See Interpreting the LED Lights in section 2, page 29 for more information. (**Note:** The Printer must have both the Power LED and the Media LED illuminated in order to print.)
Card Cleaning Roller	Automatically cleans cards for higher print quality. (**Note:** Clean the Card Cleaning Roller during every ribbon change (every 250 cards) or as needed.)
Card Input Hopper	Load blank cards into this Hopper.
Power Port	Connect to the included power cord.
Parallel Interface Port	Connect to a Windows PC with a parallel cable.

Printer Components: Centronics-Type Parallel Interface

The Card Printer is equipped with a standard 8-bit centronics-type parallel interface port. This communication port is the means through which the Printer receives data from the computer. This section describes the pin assignments and signal specifications for this port.

The Centronics-type parallel interface is the most widely used Printer interface due to its simplicity, speed and standardization throughout the PC industry.

- The Printer's parallel interface connector is a standard 36-pin Amp type with two metal-wire retaining clips and is ECP (Extended Capabilities Port) compatible. It mates with a standard, bi-directional PC to Printer parallel cable. To ensure optimal communications, keep the interface cable to 6 feet in length or under.

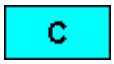
Printer Components: Print Ribbons

The Card Printer utilizes both dye-sublimation and/or resin thermal transfer methods to print images directly onto blank cards. Since the dye-sublimation and the resin thermal transfer print methods each provide their own unique benefits, print ribbons are available in resin-only, dye-sublimation-only and combination dye-sublimation/resin versions.

To make it easier to remember which print ribbons are which, a letter code has been developed to indicate the type of ribbon panels found on each ribbon. This letter code is as follows:

= Dye-Sublimation Yellow Panel

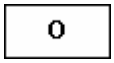
= Dye-Sublimation Magenta Panel



= Dye-Sublimation Cyan Panel

= Resin Black Panel

= Dye-Sublimation Black Panel



= Clear Protective Overlay Panel

(**Note:** Reference Technical Update No. 66 (dated 04/27/2003), there is a Firmware improvement to the Persona® C11 Card Printer and Persona® M11 Card Printer. The ribbon-queuing improvement makes the ribbon handling more robust to ensure the maximum number of prints from our color ribbons.)

Printer Components: Resin-Only Print Ribbons

Resin-only print ribbons consist of a continuous roll of a single resin color. No protective overlay panel (O) is provided since resin images do not require the protection of such an overlay. The following resin-only ribbon types are available for use with both C11 and M11:

Type	Description
Standard Resin Black (K) (provides 1,000 prints)	This ribbon provides high resin durability ideal for most general-purpose monochrome ID card applications. Resin black bar codes are readable by both infrared and visible-light bar codes scanners.
Premium Resin Black (K) (provides 1,000 prints)	This ribbon provides maximum resin durability ideal for applications such as access control where cards are repeatedly swiped through a Magnetic Stripe reader. Resin black bar codes are readable by both infrared and visible-light bar codes scanners. (**Note:** Using a Premium Resin Black ribbon will provide better photo realistic output.)
Colored Resin (provides 1,000 prints)	Several colored resin ribbons are available in a variety of colors for customizing or color-coding resin-only ID cards.
Metallic Resin (provides 1,000 prints)	Metallic resin ribbons are available for printing resin images with a unique metallic sheen.
Scratch-Off Resin (provides 1,000 prints)	A scratch-off resin ribbon is available for printing over areas of a pre-printed card in order to hide specific information such as a personal identification number.

Printer Components: Dye-Sublimation Print Ribbons

Note that the Printer requires both specialized and authorized print ribbons in order to print and function properly.

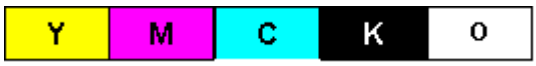
Step	Procedure
1	Do not run the cards with a contaminated, dull or uneven surface through the Printer. **Caution:** Printing onto such cards will ultimately lead to poor print quality and will greatly reduce the life of the Printhead.
2	Always store the card stock in its original packaging or in a clean, dust-free container.
3	Do not print onto cards that have been dropped or soiled. (**Note:** Printhead damage caused by contaminated or poor quality cards will automatically void the Printhead's factory warranty.)
4	If printing onto cards with a pre-punched slot, do not print over the area of the card with the punched slot. (**Note:** To avoid this area when printing, use the options in the Overlay/Print Area tab to omit printing in this area or punch the slot after the card has printed.)

Continued on the next page

Printer Components: Dye-Sublimation Print Ribbons (continued)

Type	Description
Dye-Sublimation-Only Print Ribbon	It is available in a monochrome version. This ribbon consists of dye-sublimation ribbon panels which alternate with a clear protective Overlay (O) Panel. Dye-Sublimation images must have an overlay panel applied to them or they will quickly begin to wear or fade.
Dye-Sublimation Black (BO) (provides 500 prints)	This ribbon provides a dye-sublimation black panel (B) along with an overlay panel (O) and is used to print smooth, photo-quality black and white photo ID cards. Dye-Sublimation bar codes are readable only by visible-light bar codes scanners.

Printer Components: Dye-Sublimation/Resin Print Ribbons

Type	Description
Dye-Sublimation/ resin print ribbon	The Dye-Sublimation/resin print ribbon combines the yellow (Y), magenta (M) and cyan (C) dye-sublimation panels with a resin black (K) panel. By combining both types of ribbon panels, this ribbon can be used to print full-color, photo-quality images with the dye-sublimation panels along with sharp, black text and bar codes with the resin black panel. A clear overlay panel (O) is also included on most ribbons to protect the dye-sublimation images. Dye-Sublimation images must have an overlay panel applied to them or they will quickly begin to wear or fade.
Full-Color (YMCKO) (provides 250 prints)	This ribbon is used to print full-color photo ID cards along with resin black text and bar codes. Both infrared and visible-light bar code scanners can read bar codes printed with resin black. • An overlay panel (O) is included to protect the full-color dye-sublimation printing. 

Printer Components: Blank Cards

Type	Description
Card Size	The Card Printer accepts standard CR-80 sized cards (3.370” L x 2.125” W/85.6mm L x 54mm W) with a thickness of 30 mil (.030"/.762mm).
Card Design	The Printer will print onto any card with a clean, level and polished PVC surface. Although the Printer is equipped with card cleaning rollers, it is very important to always print onto cards specifically designed for direct-to-card dye-sublimation printing.
Card Surface	Suitable cards must have a polished PVC surface free of fingerprints, dust or any other types of embedded contaminants. In addition, cards must have a completely smooth, level surface in order for the Printer to achieve consistent color coverage. • Certain types of Proximity cards have an uneven surface that will inhibit consistent color transfer. • Certain types of smart card chips are raised slightly above the cards surface which also results in poor color transfer.
UltraCard Stock	Due to the importance of using high-quality blank cards, a factory-approved card stock called UltraCard™ is available and recommended for best results. • UltraCard stock has a glossy PVC laminate on top and bottom and is optically inspected to provide the cleanest, most scratch and debris-reduced cards possible. • Two types of these cards are available: UltraCard and UltraCard III. UltraCard stock has a PVC core and offers medium card durability. UltraCard III stock has a 40% polyester core and offers high durability. • Both types of UltraCards produce printed images with a glossy, photo-quality finish.

Reviewing the upgraded 81754 PVC Cards

The upgraded 81754 PVC cards are designed for a sharper card image quality and for reduced debris and defects on Fargo Card Printers. Carefully read these detailed notes and instructions before applying this information to your Fargo printer or printers.

- **Technician Note 1:** The new card lot number starts at **Lot # 2010104** with date codes that started on **04/01/2003**. The photo (below) shows a lot number that starts after **Lot # 2010104**, indicating a new card lot number. The **card lot number** and **date** can be read on the bar code label attached to the shrink-wrapped stack of 100 cards, as shown below. All new Fargo printers with a serial number (S/N) starting with A320 will have factory settings for these new 81754 PVC cards.

- **Technician Note 2:** Do not use the new 81754 PVC card stock with Fargo laminating printers/encoders. This same guideline is used for the existing 81754 PVC card stock. Fargo recommends using the UltraCard III stock with the Fargo laminating printers/encoders.

Reviewing the upgraded 81754 PVC Cards (continued)

Follow these two (2) instructions below:

1. **Instruction for new 81754 PVC card stock:** Increase the Printer Driver's Dye-Sub Intensity to print with the new 81754 PVC card stock on Fargo Card Printers (S/N A319 and older). See the chart provided below. See the appropriate Fargo service documents for specific Printer Driver instructions.

Card	New Printer (S/N A320 and newer)	Old Printer (S/N A319 and older)
New Card	No Change Necessary	Increase the Dye-Sub Intensity as follows: HDP®: N/A Pro-LX/C25: 3 - 5 % DTC500: 5 -10 % C11/C16: 3 - 5 %

2. **Instruction for existing 81754 PVC card stock:** The Printer Driver's Dye-Sub Intensity setting may or may not need to be decreased to print existing card stock. See the chart provided below. See the appropriate Fargo service documents for specific Printer Driver instructions.
   - **Technician Note 1:** To control the brightness of the image, adjust the **Dye-Sub Intensity** slide on the **Image Color** tab of the Printer Driver.
   - **Technician Note 2:** Moving the **Dye-Sub Intensity** slide to the left causes less heat to be used in the printing process, thus generating a lighter print.

Card	New Printer (S/N A320 and newer)	Old Printer (S/N A319 and older)
Old Card	Decrease the Dye-Sub Intensity as follows: HDP®: N/A Pro-LX/C25: 3 - 5 % DTC500: 5 - 10 % C11/C16: 3 - 5 %	No Change Necessary

Section 2: General Troubleshooting

This section provides Troubleshooting procedures for this Printer for Communication Errors, Card Feed Errors, Print Process Errors, Card Jam Errors, Encoding Errors and Diagnosing Image Problems.

Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger:	**Failure to follow these installation guidelines can result in death or serious injury.** Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair procedures, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these procedures.
Caution:	**This device is electrostatically sensitive**. **It may be damaged if exposed to static electricity discharges.** Information that raises potential electrostatic safety issues is indicated by a warning symbol (as shown to the below). • **To prevent equipment or media damage**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent equipment or media damage**, observe all established Electrostatic Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. • **To prevent equipment or media damage**, always wear an appropriate personal grounding device (e.g., a high quality wrist strap grounded to avoid potential damage). • **To prevent equipment or media damage**, always remove the Ribbon and Cards from the Printer before making any repairs, unless otherwise specified. • **To prevent equipment or media damage**, take jewelry off of fingers and hands, as well as thoroughly clean hands to remove oil and debris before working on the Printer.

Interpreting the LED Lights

Power LED ⏻	**Media LED**	**Cause/Solution**
On solid	On solid	Printer is ON and READY to print.
On solid	Flashing	Indicates an error with the media (print ribbon or cards). Refer to the following suggestions: The cards or ribbon have run out. Replace as necessary. • Check that the cards are properly loaded in the Printer. See Card Feeding Errors in Section 2, page 33. • Check that the proper ribbon type is installed according to the ribbon type option selected in the Printer driver. See Adjusting the Ribbon Type option in Section 3, page 88. • Check for a ribbon jam or card jam. See Resolving a Card Jam Error in Section 2, Page 39. • The Ribbon Sensor may need to be recalibrated. See Using the Sensors button in Section 3, Page 101. • If your Printer has a magnetic encoding module installed and you are attempting to encode magnetic information onto a card while printing, a flashing Media LED can also indicate an encoding mis-verify. • If information is not encoded properly or encoded onto a bad Magnetic Stripe, the Printer is unable to verify the encoded data. When this happens, the Printer will eject the card before printing begins and the Media LED will begin flashing. Press the Media button to resume encoding and printing with a new card. See Encoding Errors in Section 2, Page 50.

Continued on the next page

Interpreting the LED Lights (continued)

Power LED ⏻	Media LED	Cause/Solution
Flashing	On solid	Indicates a possible error with your Printer's memory. See Replacing the Print Circuit Board (A000281) in Section 4, Page **Error! Bookmark not defined.**.
On solid	Off	Indicates the Printer is ON, but that it is off-line or paused. Press the Media button to get the Printer back to its READY mode.
Off	Off	Indicates the Printer power is OFF. Be sure power is connected and press the Power button ⏻ if you would like to turn the Printer back ON.

Communications Errors

Resolving the Communication Errors

Symptom(s): Incorrect output, communications error on PC or Printer, stalling, no response from Printer, no job printed, “paper out” error.

Step	Procedure
1	Confirm that the system meets the minimum requirements, as shown here: • IBM-PC or compatible. • Windows 95/98/ME/NT/2000/XP Pentium™ class 133 MHz computer with 32 MB of RAM or higher • 200 MB free hard disk space or higher • ECP parallel port with DMA access
2	Confirm the correct installation of the Printer driver. a. Close the software program and check the Printer driver. b. Reboot the computer. c. Make sure the Printer driver is installed correctly. (**Note:** Especially if an obsolete driver was recently removed.) d. Be sure the correct setup options within the Printer driver are selected. e. Confirm that the driver is current by checking at: www.fargo.com

Continued on the next page

Resolving the Communication Errors (continued)

Step	Procedure
3	Verify the use of an adequate data cable. a. Use a double-shielded parallel cable (no longer than six feet in length). (**Note:** Data transmission failure can be attributed to a long or faulty parallel cable.) b. Use a double-shielded, I-EEE 1284 compliant cable to reduce the effect of radio emissions from computers, monitors and other equipment that may broadcast Radio frequency interference (RFI).
4	Determine if there is interference from an external device. a. Do not use an A/B Switch Box or other peripheral in line with the parallel cable. b. If using a Switch Box or other peripheral, remove it while testing communication between the Computer and the Printer. c. If needed, replace the Switch Box or other peripheral (once it is determined that the cause of the interference is not the switch box or peripheral). d. **Alternative:** Add a second parallel port into the computer (if a second Printer is required).
5	Determine the problem with printing from the application. a. Print a self-test from the Printer by holding down the Media button on power up to ensure that the Printer (itself) is functioning properly. b. Print the Windows test page that is located in the General tab of the driver. c. Use **WordPad** (a Windows 95/ 98/ ME/ NT/ 2000/XP word processing program in the Accessories Program Group). 1) Go to the **File** menu and select **Page Setup**. 2) Click on the **Printer** button and select the C11 Card Printer. 3) Click OK and reset all four margins to zero. (**Note:** The WordPad will automatically replace the values with it's minimum margins.) 4) Open the program and type: "This is a Test." then, go to **File** on the menu bar and select **Print**.

Continued on the next page

Resolving the Communication Errors (continued)

Step	Procedure
6	Determine if the parallel port mode is set correctly or incorrectly a. Ensure that the parallel port is set to the Enhanced Communication Port (ECP) mode. (**Note:** The port mode can be determined by checking the Device Manager tab in the system control panel.) b. If the port mode is not set to ECP, it will need to be changed in the computers BIOS. (**Note:** Refer to the appropriate computer manual for instructions on how to change the Parallel Port mode.)
7	Determine whether there is adequate hard drive space. (**Note:** A large volume of temporary files on the computer can cause communications errors.) a. Access the temporary files by following this process: • Search for all folders called TEMP. Once found, clear out the contents of the folders. • If using Windows 95/98/ME/2000/XP, run the System Utility - Disk Defragmenter found in the Accessories folder of the **Start** Menu. • Use a disk cleanup utility (such as **Disk Cleanup** found in the System Tools folder of the Start menu) or use a third party application.

Card Feeding Errors

Resolving the Card Feeding Errors

Symptom: Two or more cards feed at the same time or the cards will not feed at all.

Step	Procedure
1	Clean the Input Roller. a. **Caution:** Turn off the Printer and unplug the power cord from the Printer. b. Remove all cards from the Printer's Card Input Hopper. c. Get a Cleaning Card from the Printer Cleaning Kit and remove its adhesive backing paper. d. Insert the Cleaning Card into the card output end of the Printer until the card stops. (**Caution:** Be sure to insert the card so that the longest end of the card is inserted first with the sticky side facing up.) e. Press and hold the Printer's Media button while applying power to start a self-test. f. This will begin feeding the Cleaning card into the Printer. g. When the Printer errors out, open the top cover and use the **Media** button to remove the cleaning card.
2	Adjust the card separator flap. a. Loosen the two screws located in the Input Hopper. b. Open the Top Cover and remove the Print Ribbon from the Printer. c. Tighten the adjustment screws on both sides of the Card Separator Flap to raise the card separator. Loosen the adjustment screws on both sides of the Card Separator Flap to lower the card separator.

Using the Idler Spring Upgrade Kit

The purpose of Technical Update No. 45 was to announce the release of the Idler Spring Upgrade Kit for the Persona C11, M11 and C16 Card Printers.

- **Improvement:** The new Idler Spring Upgrade Kit provides more reliability when feeding cards through the Card Printer. (**Technician Note:** The previous Idler Springs were prone to breaking at an approximate output of 1000 cards.)
- **Order No. 1 (without Magnetic Encoder):** If using the Persona C11, M11 or C16 Card Printer without a Magnetic Encoder installed order Part Number 085690.

  OR

Order No. 2 (with Magnetic Encoder): If using the Persona C11, M11 or C16 Card Printer with a Magnetic Encoder installed order Part Number 085691.

Print Process Errors

Resolving a Headlift Motor or Sensor Error

Symptom: The Printhead continuously cycles or does not cycle at all.

Step	Procedure
1	Cycle the Headlift Motors. a. Press both buttons on the front control panel. b. Verify that the Headlift Motor turns. c. If the Motor does not turn, continue to Step 2.
2	Test the Headlift Motors. a. Unplug the Printer. b. Remove the back cover. c. Disconnect the Headlift Motor from the main board. d. Connect a 9-volt battery to the Head Motor. e. If the Motor does not turn, replace it. f. If the Motor does turn, continue to Step 3.
3	Test the Headlift Sensor. a. Remove the back cover. b. Attach the positive lead from a Digital Voltmeter to Pin 1 of J6. Attach the negative lead to the Pin 3 of J6. • If **open**, the Sensor should read 0.17 to 0.9 VDC. • If **closed**, the Sensor should read 4.9 to 5.5 VDC. c. Replace the Sensor if the voltages do not read correctly.

Resolving the Cover Open Error Message

Symptom: The Printer errors immediately after sending a print job or the rollers do not operate by pressing the cottons on the front panel (when the cover is open).

Step	Procedure
1	Reseat the Cover Switch. a. Open the top cover and remove the Print Ribbon. b. Remove the two screws from the Cover Switch located near the ribbon take up hub. c. Reseat the switch on the Printer side plate and carefully replace the screws. (**Note:** Ensure that the screws holding the cover Sensor in place are not too tight. They should be tight enough to hold the switch in place snugly, but not so tight as to compress the inner components of the switch.)

Resolving the Blank Output issues

Symptom: A card is ejected blank (that should be printed).

Step	Procedure
1	Run a self-test. a. Clear any card jams. b. Unplug power from the Printer. c. While holding down the **Media** button, reapply power. (**Note:** A self-test card will be printed.)
2	Look for an image on the ribbon. a. After a self-test has been run, open the top cover. b. Remove the print ribbon from the Printer. c. Visually inspect the set of panels that were last used by the Printer. d. If an image is noticeable on the used ribbon, continue to step 3. e. If an image is not noticeable on the used ribbon, continue to step 4.
3	Adjust the placement. a. Reset the Printer to clear any Error Messages by removing the power and reapplying it. b. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the C11 Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the C11 Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the C11 Card Printer and select **Printing Preferences**. c. Click the Calibrate tab. d. Click on the **Settings** button. e. Adjust the Image Placement Setting by +5. f. Click on the **OK** button. g. Print a self-test. h. After adjusting the Image Placement, if a white border appears on the card, adjust the image placement back toward its original value in increments of 2 until the white edge is gone.

Continued on the next page

Resolving the Blank Output issues (continued)

Step	Procedure
4	Check the Printhead connections. a. Open the top print cover. b. Remove the two (2) thumbscrews from the Printhead cover plate and remove the cover plate. c. Check to ensure that Power and Data Cables (that connect to the printhead) are properly seated. d. Remove the Back Cover. e. Ensure that the Printhead Power Cable is properly seated on J11 on the Power board. f. Ensure that the Printhead Data Cable is properly seated on J13 on the main board.
5	Ensure that the proper voltage is being applied to the printhead. a. Remove the back cover. b. Using a Digital Voltmeter, connect the negative lead to ground. c. Probe Pins 1 to 5 of the printhead power connection on J11. d. Ensure that a voltage between 22 to 23 VDC is read on each pin. • If less than 22 volts is read on any of the pins, ensure that the Power Supply for the Printer is outputting 23 to 24 VDC. • If 22 to 23 volts is read from Pins 1 to 5 on J11, replace the Printhead (as needed). e. If the Power Supply is operating properly, replace the Main Board (as needed).

Card Jam Errors

Resolving a Card Jam Error

Symptoms: The card is physically jammed in the Printer or a Card Sensor is reporting a card is present.

Step	Procedure
1	Look for a jammed card in the Printer. a. Open the Printer's top cover. b. Remove the ribbon from the Printer. c. Check to see if a card is jammed in the print station of the Printer. d. If a card is found in the print station, continue to Step 2. e. If no card was found in the print station, continue to Step 3.
2	Clearing a jammed card a. If a card is jammed in the Printer, use the **Power** button and the **Media** buttons to move the feed rollers and free the card. b. The card can then be fed out of the Printer.
3	Test the Card Sensor. a. Remove the rear cover. b. Using a Digital Voltmeter, connect the negative lead to ground. c. Connect the positive lead to Pin 1 of J8. • If **blocked**, the voltage should read 4.9 to 5.5 VDC. • If **unblocked**, the Sensor should read 0.15 to 0.18 VDC. d. If the voltages do not read correctly, replace the Sensor.

Ribbon Errors

Resolving the Skipping Ribbon Panel issues

Symptom: The Printer is using more than one set of ribbon panels to print one side of a card.

Step	Procedure
1	Calibrate the Ribbon Sensor. (See the next page for illustration.) a. Reset the Printer to clear any Error Messages by removing Power and reapplying. b. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the C11 Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the C11 Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the C11 Card Printer and select **Printing Preferences**. Click on the Calibrate tab. c. Click on the **Sensors** button. (See the next page.) d. Remove the ribbon and close the top cover. e. Click on the **Send** button for a ribbon Sensor calibration. f. Verify that the Printer beeps twice. g. If the Printer does not beep twice, see Communications Errors in Section 2, Page 30.

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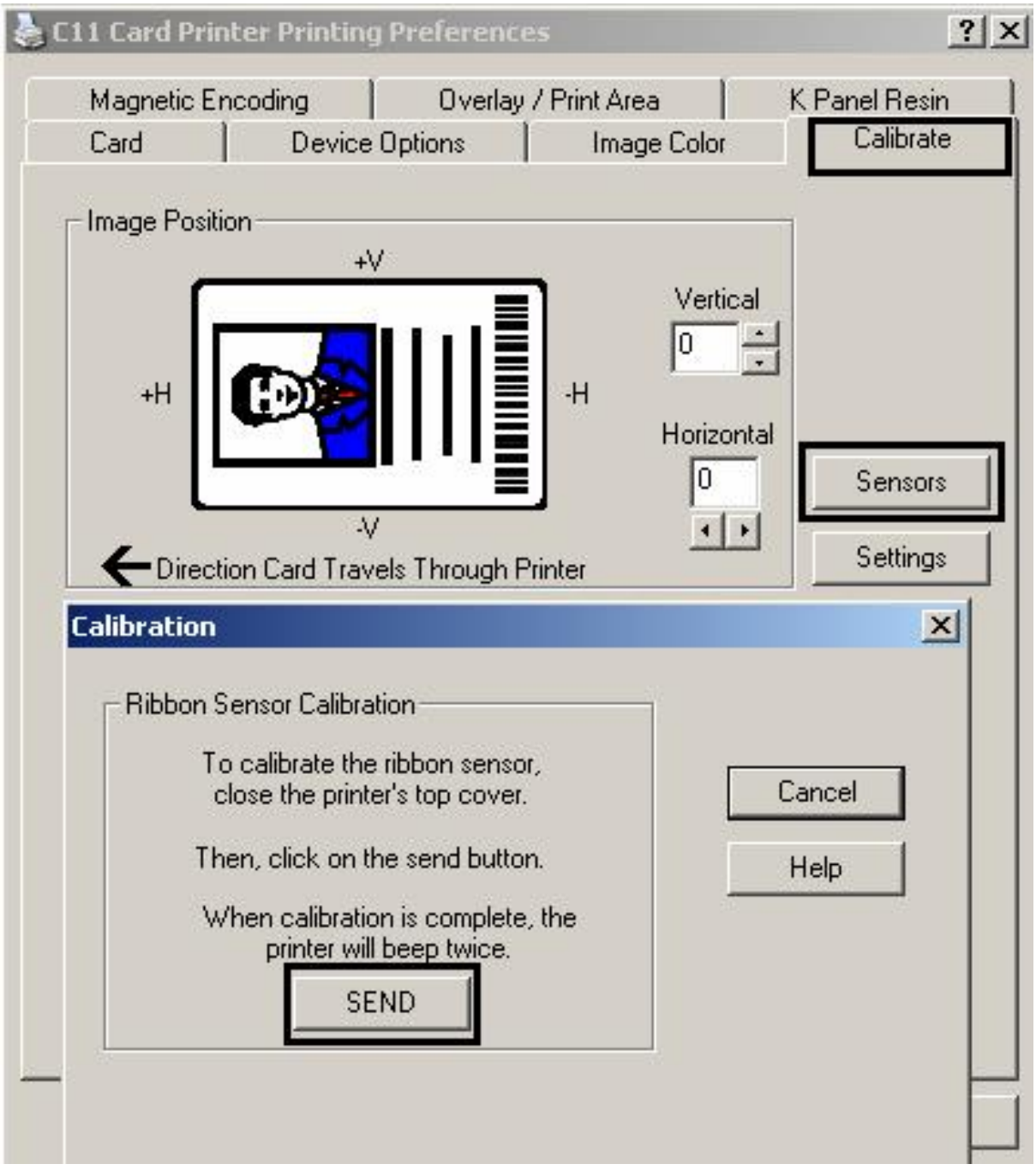
Resolving the Skipping Ribbon Panel issues (continued)

Refer to the previous procedure.



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Resolving the Skipping Ribbon Panel issues (continued)

Step	Procedure
2	Test the Encoder Sensor. a. Remove the back cover. b. Using a Digital Voltmeter, connect the negative lead to ground. c. Connect the positive lead to Pin 4 of J13. • If **blocked**, the voltage should read 4.9 to 5.5 volts DC. • If **unblocked**, the Sensor should read 0.15 to 0.18 volts DC. d. If the voltages are not correct, replace the Sensor.

Resolving the Wrong Ribbon error (being displayed incorrectly)

Symptom: A Wrong Ribbon Error is shown on the LEDs even though the correct ribbon is installed in the Printer.

Step	Procedure
1	Verify the driver settings are correct. a. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the C11 Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the C11 Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the C11 Card Printer and select **Printing Preferences**. b. Click on the Device Option tab. c. Ensure that the Ribbon Type setting that is listed matches the ribbon that is installed in the Printer. (**Note:** It may be possible to have driver settings that are different from those found in the Printer control panel through the software.) d. Check any page setup functions in the software to ensure that the Ribbon type matches.

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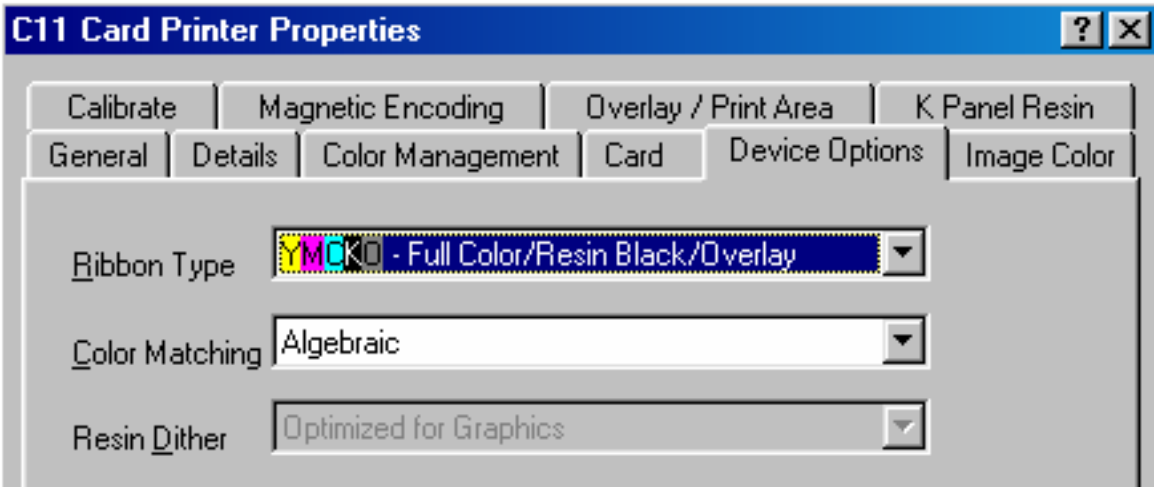

Resolving the Wrong Ribbon error (being displayed incorrectly) (continued)

Step	Procedure
2	Test the Ribbon ID Sensor. a. Unplug the Printer. b. Remove the back cover. c. Flip switches 1,2,3 and 4 on the bank of DIP switches in the Main Board corner. d. With the top covers closed, apply power to the Printer while holding down the **Pause/Resume** button. e. Open up the Top Print Cover. f. Slowly rotate the supply side of the ribbon. (**Note:** As the spool is rolling, the Printer should emit a beep every time a metal pin from the Ribbon ID Core passes the Sensor.) g. Replace the Ribbon ID Sensor if the Printer responds by emitting no beeps or if one long set of beeps is emitted (regardless of the ribbon's position).

Resolving the Ribbon Low Message

Symptoms: The Printer beeps just before each ribbon panel is printed. The ribbon is running low, which indicates the print ribbon is running low and that it will soon run out. When this message is displayed, there should be 10 to 20 additional prints left on the ribbon.

Step	Procedure
1	Print until the ribbon is gone and replace the ribbon as needed. (**Note:** If the print ribbon runs out in the middle of a print job, the job will be incomplete. It may be difficult to resume the job after the error and still have all cards print well.)

Resolving the Ribbon Breaking issues

Symptom: The Ribbon breaks when printing.

Step	Procedure
1	Calibrate the Ribbon Sensor. a. Reset the Printer to clear any Error Messages by removing Power and reapplying. b. From the Computer, open the Printer control panel. • If using Windows 95/98/ME, right click on the C11 Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the C11 Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the C11 Card Printer and select **Printing Preferences**. c. Click the Calibrate tab. d. Click on the **Sensors** button. (See the next page.) e. Remove the Ribbon and close the top cover. f. Click on the **Send** button for a Ribbon Sensor Calibration. g. Verify that the Printer should then beep twice. h. If the Printer does not beep twice, see Communications Errors in Section 2, page 30.

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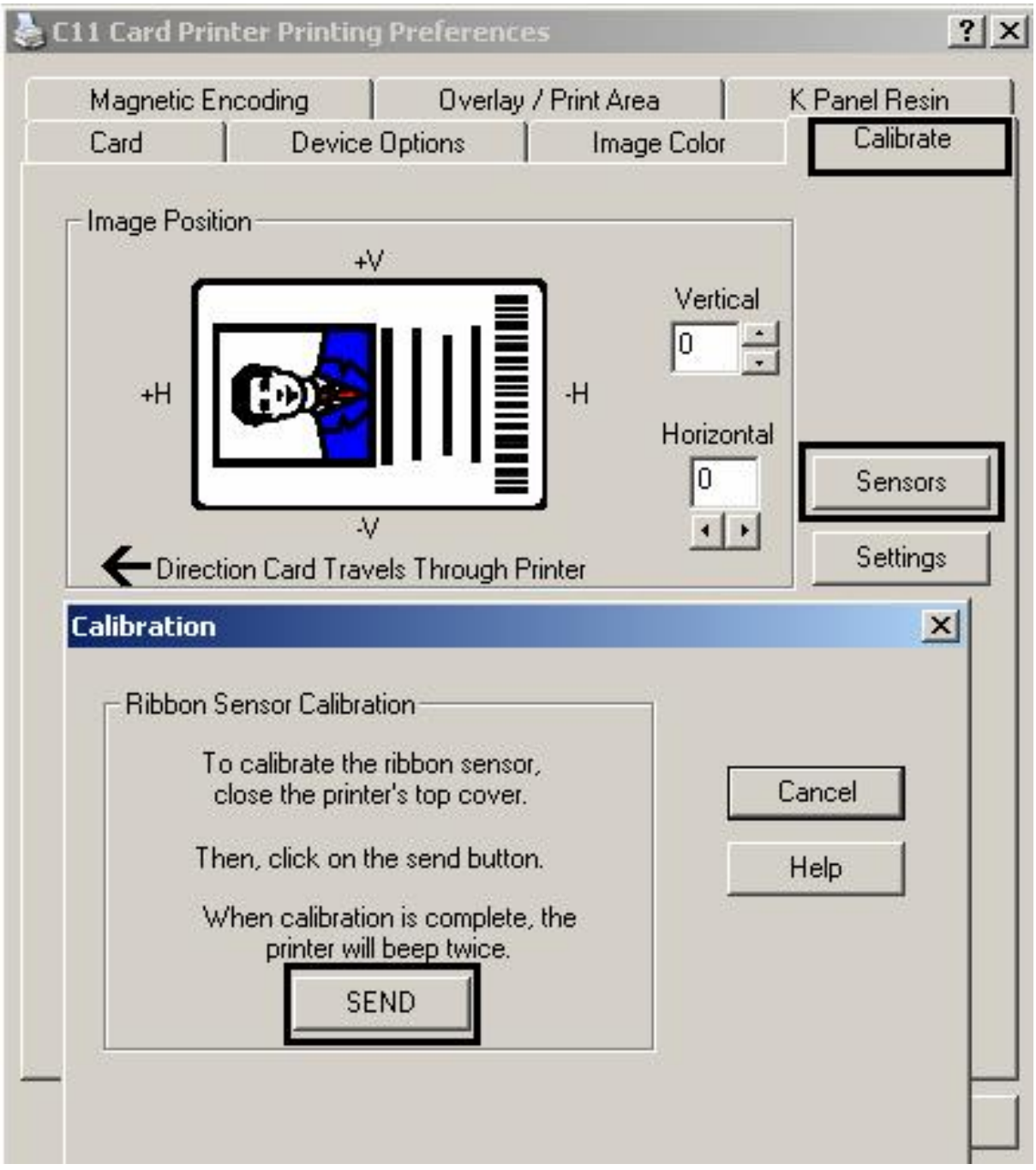
Resolving the Ribbon Breaking issues (continued)



Resolving the Ribbon Breaking issues (continued)

Step	Procedure
2	Determine where the ribbon is breaking. a. Open the Top Print Cover. b. Remove the ribbon from the Printer. c. Inspect the ribbon at the break point. • If the Ribbon broke before any print was applied to the card, continue to Step 3. • If the Ribbon broke after applying the print to the card, continue to Step 4.
3	Adjust the Image Placement negatively. a. Reset the Printer to clear any Error Messages by removing Power and reapplying. b. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the C11 Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the C11 Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the C11 Card Printer and select **Printing Preferences**. c. Click the Calibrate tab. d. Click on the **Settings** button. (See the next page.) e. Adjust the **Image Placement Setting** by -10. f. Click on **OK**. g. Print a Self-Test. h. After adjusting the Image Placement, if a white edge appears on the card, adjust the image placement back toward its original value in increments of 2 until the white edge is gone.

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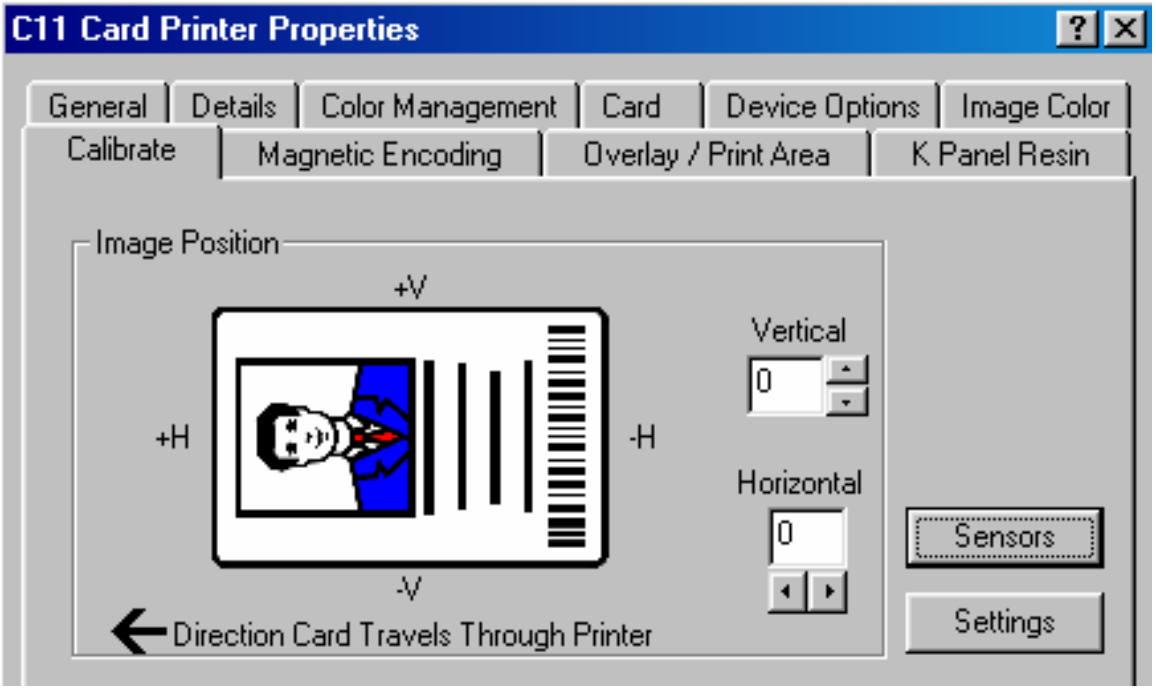
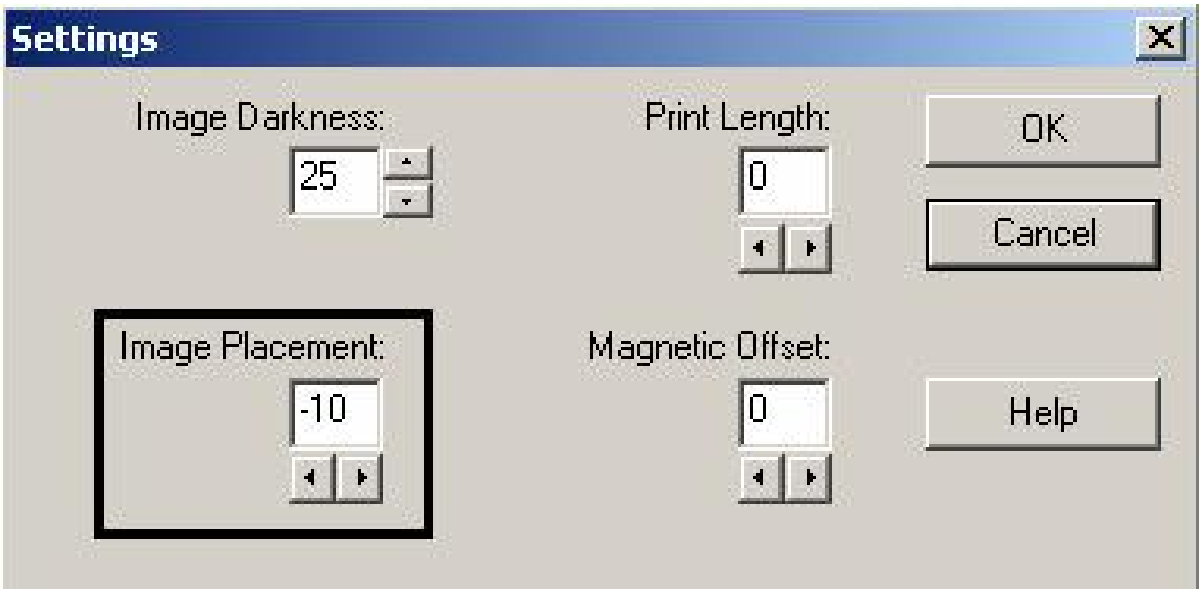
Resolving the Ribbon Breaking issues (continued)





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Resolving the Ribbon Breaking issues (continued)

Step	Procedure
4	Adjust the Image Placement positively. a. Reset the Printer to clear any Error Messages by removing Power and reapplying. b. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the C11 Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the C11 Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the C11 Card Printer and select **Printing Preferences**. c. Click the Calibrate tab. d. Click on the **Settings** button. e. Adjust the **Image Placement Setting** by +10. (See the previous page.) f. Click on **OK**. g. Print a Self-Test. h. After adjusting the Image Placement, if a white edge appears on the card, adjust the image placement back toward its original value in increments of 2 until the white edge is gone.

Encoding Errors

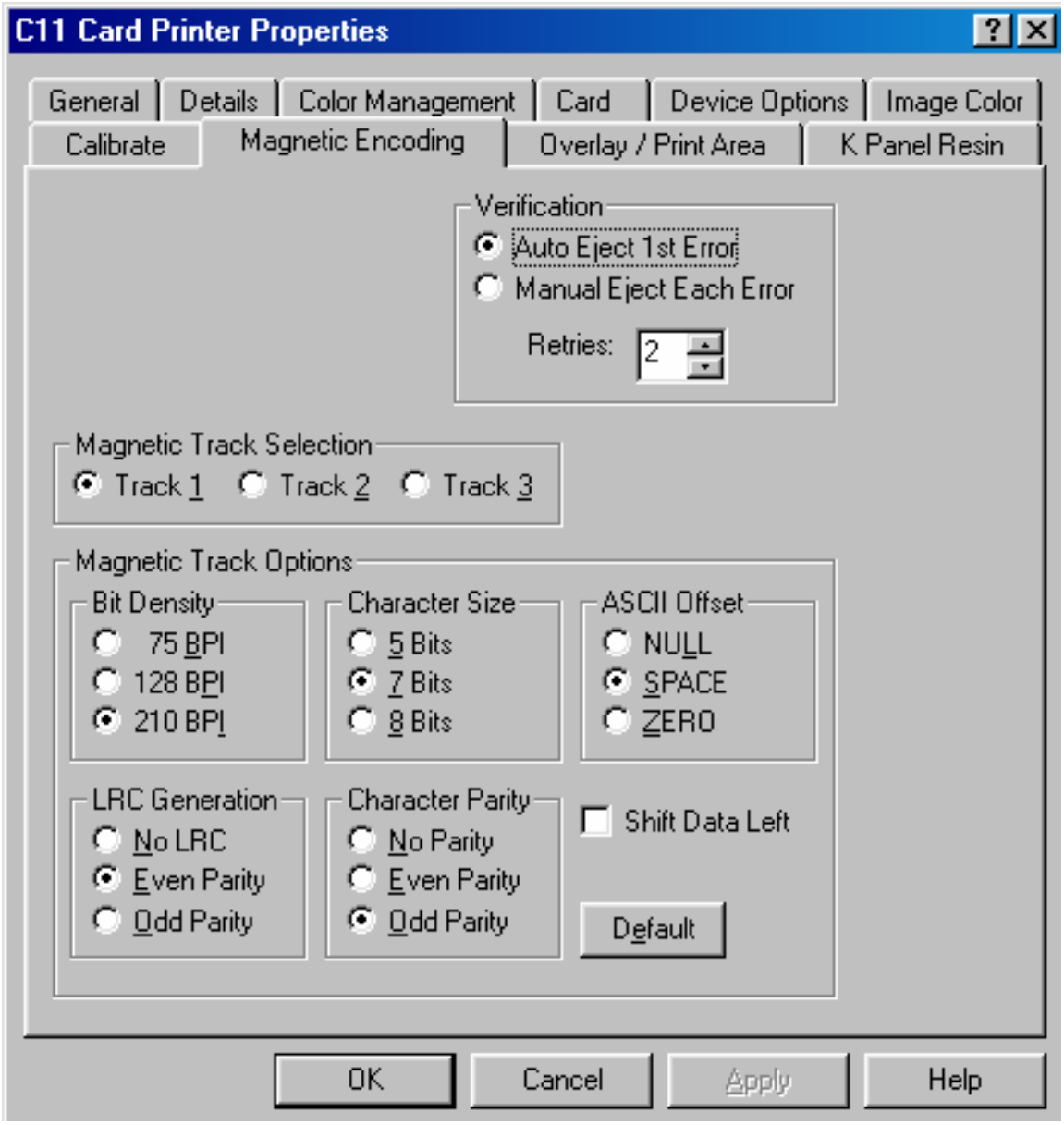
Resolving the Mag Verify Error Message

Symptoms: A Mag Verify error is displayed on the LED when attempting to encode.

Step	Procedure
1	Check to ensure that the cards are loaded with the Magnetic Stripe facing down and towards the back of the Printer.
2	Verify the Driver settings if cards are loaded properly. See the Using the Magnetic Encoding tab procedure in Section 3, page 88. See Magnetic Encoding tab window on next page.
3	Verify that data is being encoded to the Magnetic Stripe. a. Clear any Error Messages from the LCD by unplugging the Printer and reapplying power. b. Remove the failed card. c. Use a Magnetic Stripe reader or magnetic developer spray to determine if data is being written to the Magnetic Stripe. d. If data is not being written to the Magnetic Stripe, remove the back cover and verify that the magnetic head is plugged into J18 on the main board. e. If the Magnetic head connection is properly seated, replace the magnetic head (as needed). See the Replacing the Magentic Head Assembly (High-Coercivity: 83019012 or Low-Coercivity: 83019012) procedure in Section 5, page **Error! Bookmark not defined.**. f. If data is being written to the Magnetic Stripe, the Magnetic Offset may need to be adjusted. See the Resolving the Mag Verify Error Message procedure in Section 3, page 50.
4	Verify that the coercivity of the cards matches the type of Mag Head installed in the Printer.

Continued on the next page

Resolving the Mag Verify Error Message (continued)



Resolving the Printer's inability to read Encoded Data

Step	Procedure
1	Verify that the cards are loaded properly with the Magnetic Stripe facing down and towards the back of the Printer.
2	Verify that the card is encoded with magnetic data by using a Magnetic Imager or Developer Solution.
3	Use **WordPad** (a Windows 95/ 98/ ME/ NT/ 2000/XP word processing program in the Accessories Program Group). a. Go to the **File** menu and select **Page Setup**. b. Click on the **Printer** button and select the C11 Card Printer. c. Click OK and reset all four margins to zero. (**Note:** The WordPad will automatically replace the values with its minimum margins.) d. Open the program and type: "~1%JULIEANDERSON^1234567890?" then, go to **File** on the menu bar and select **Print**. (**Note:** The Printer should then feed a card into the Encoder and magnetically encode the above string to it.)
4	Check the Magnetic Offset Setting. a. Reset the Printer to clear any Error Messages by removing the power and reapplying it. b. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the C11 Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the C11 Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the C11 Card Printer and select **Printing Preferences**. c. Click the Calibrate tab. d. Click on the **Settings** button. e. Ensure that the Magnetic Offset setting matches the value that is written on the bottom of the Printer. f. If the values do not match, change the value in the Settings box.
5	Verify that the coercivity of the cards matches the type of Mag Head installed in the Printer.
6	Verify that the Magnetic Stripe on the card is free of scratches or voids.

Resolving Data intended for Magnetic Stripe (being printed on the card) problem

Step	Procedure
1	Confirm that the application is formatting the magnetic string correctly. See the Using the Magnetic Track Options procedure in Section 3, page 104.
2	Use **WordPad** (a Windows 95/ 98/ ME/ NT/ 2000/XP word processing program in the Accessories Program Group). a. Go to the **File** menu and select **Page Setup**. b. Click on the **Printer** button and select the C11 Card Printer. c. Click OK and reset all four margins to zero. (**Note:** The WordPad will automatically replace the values with its minimum margins.) d. Open the program and type: "~1%JULIEANDERSON^1234567890?" then, go to **File** on the menu bar and select **Print**. (**Note:** The Printer should then feed a card into the Encoder and magnetically encode the above string.) (**Note:** If encoding from WordPad works properly, both the Printer and communication from the computer are working properly. This indicates that the issue is with the software application that is being used. Refer to the users guide for the software application for more info on encoding.)

Diagnosing Image Problems

Resolving the Pixel Failure problems

Symptom: A thin line or scratch travels the entire length of the card.

Step	Procedure
1	Check the card stock for scratches. Replace the cards (as needed).
2	Examine the Printhead for visible damage.
3	Clean the Printhead. See Cleaning the Printhead procedure in Section 4, page 181.
4	Clean the Platen Rollers. See Cleaning the Platen Rollers procedure in Section 4, page 184.
5	Replace the printhead if the problem persists. See the Replacing the Printhead Assembly (820199) procedure in Section 5, page **Error! Bookmark not defined.**.

Resolving the Card Surface Debris problems

Symptom: Prints have spots (white or colored voids) and/or dust on them.

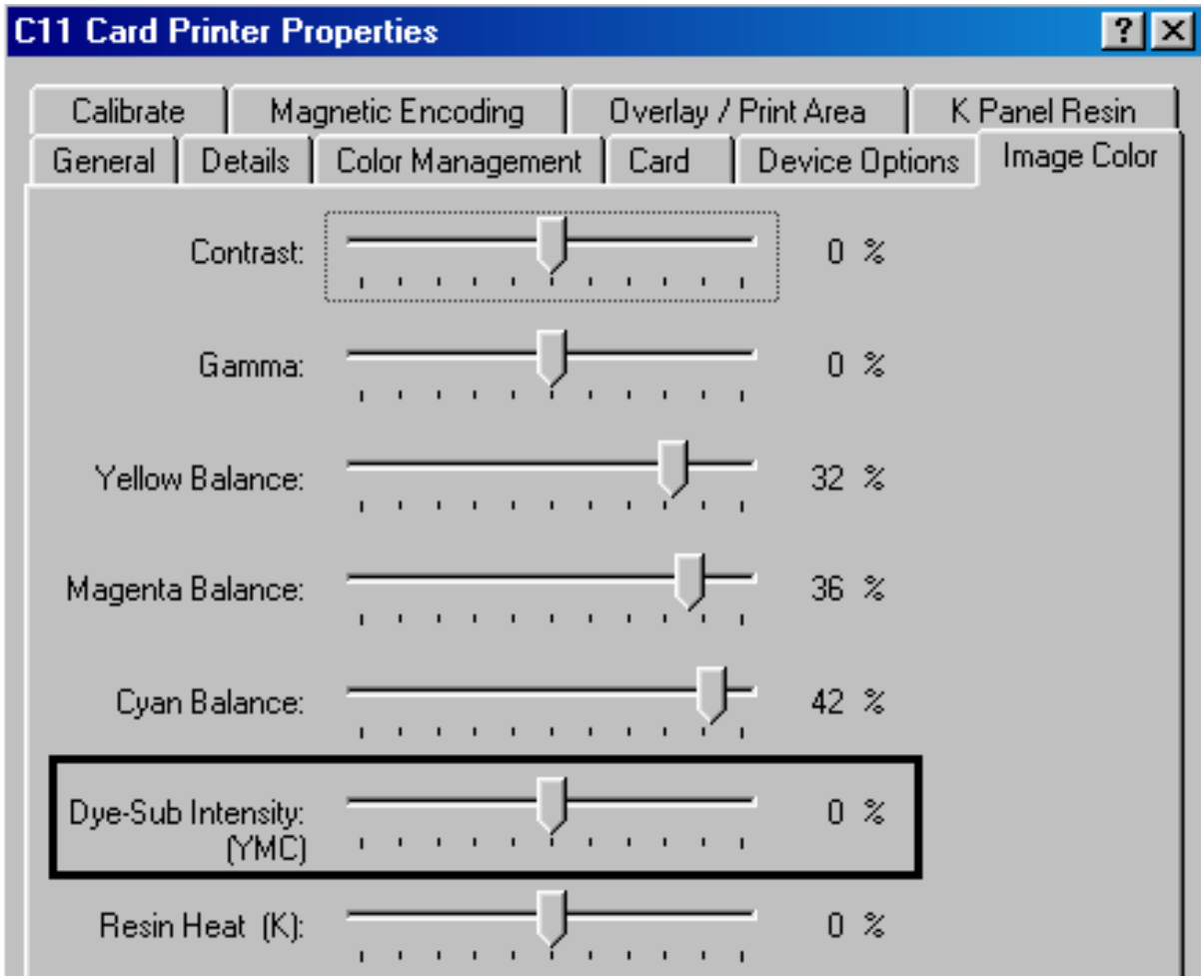
Step	Procedure
1	Be sure the cards are clean and stored in a dust-free environment. Do not use cards with embedded contaminants in the surface.
2	Clean the inside of the Printer. See Cleaning the Printer's Interior procedure in Section 4, page 185.
3	Clean the Platen Rollers. See Cleaning the Platen Rollers procedure in Section 4, page 184.
4	Clean the Cleaning Roller. See Cleaning the Card Feed and Cleaning Rollers in Section 4, page 181.

Resolving the Incorrect Image Darkness problems

Symptom: Printed cards are too dark or too light.

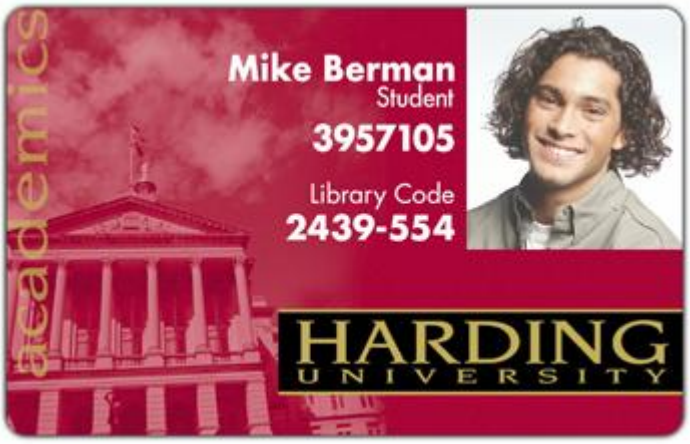
Step	Procedure
1	Run a self-test to ensure that the issue is not with the driver settings.
2	Adjust the **Dye-Sub Intensity** setting within the Image Color tab of the Printer Driver. See Using the Image Color tab procedure in Section 3, page 95.

Continued on the next page



Resolving the Incorrect Image Darkness problems (continued)

Step	Procedure
3	Correct the **Image Darkness**. See Using the Image Darkness option in Section 3, page 80.

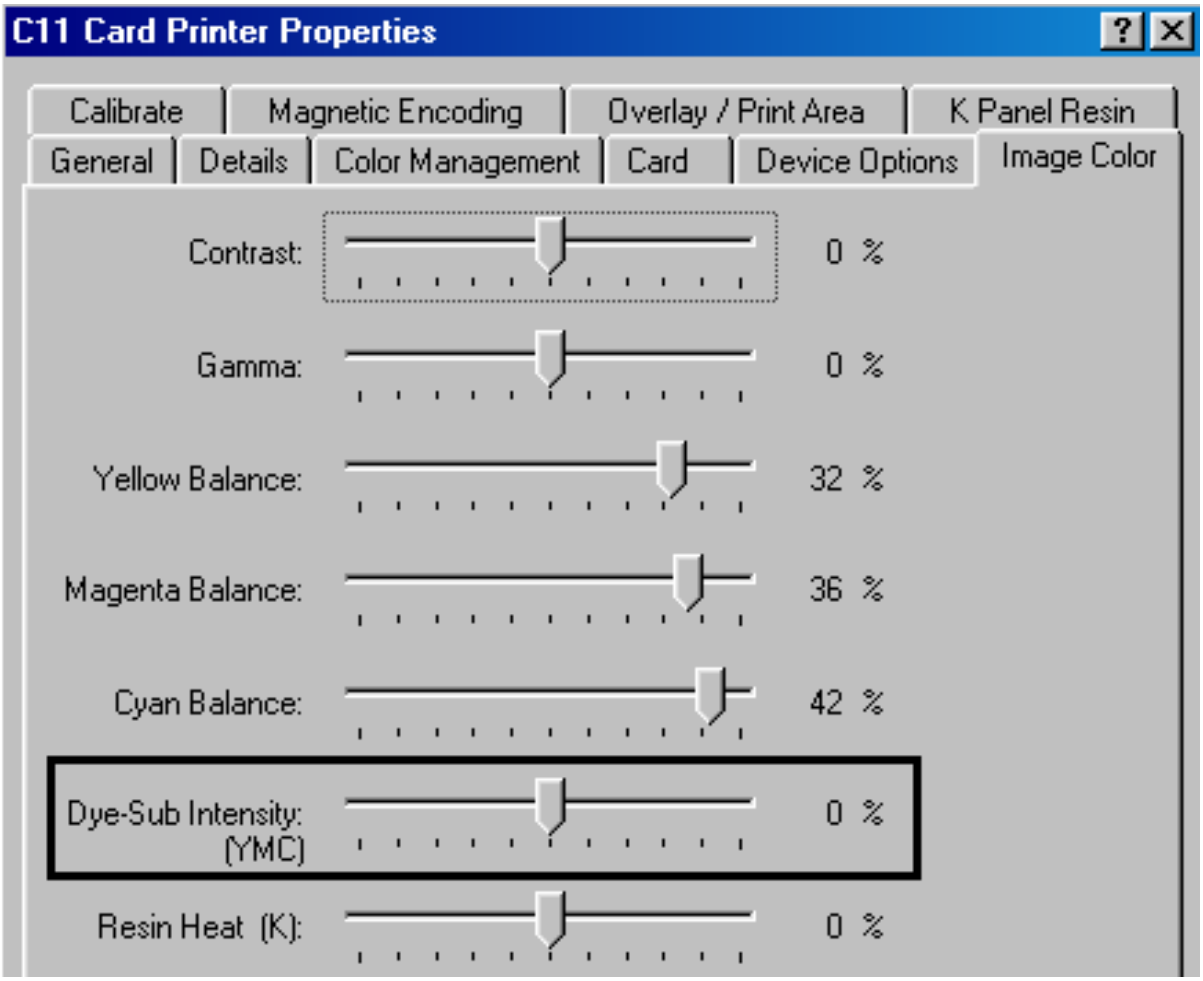


Resolving the Ribbon Wrinkle problems

Symptom: Printed cards have off-colored lines or streaks on them.

Step	Procedure
1	Confirm that the Printer is using the most current driver via: http://www.fargo.com
2	Reduce the **Dye-Sub Intensity** setting within the Image Color tab of the Printer driver. See the Using the Image Color tab procedure in Section 3, page 95.

Continued on the next page



Resolving the Ribbon Wrinkle problems (continued)

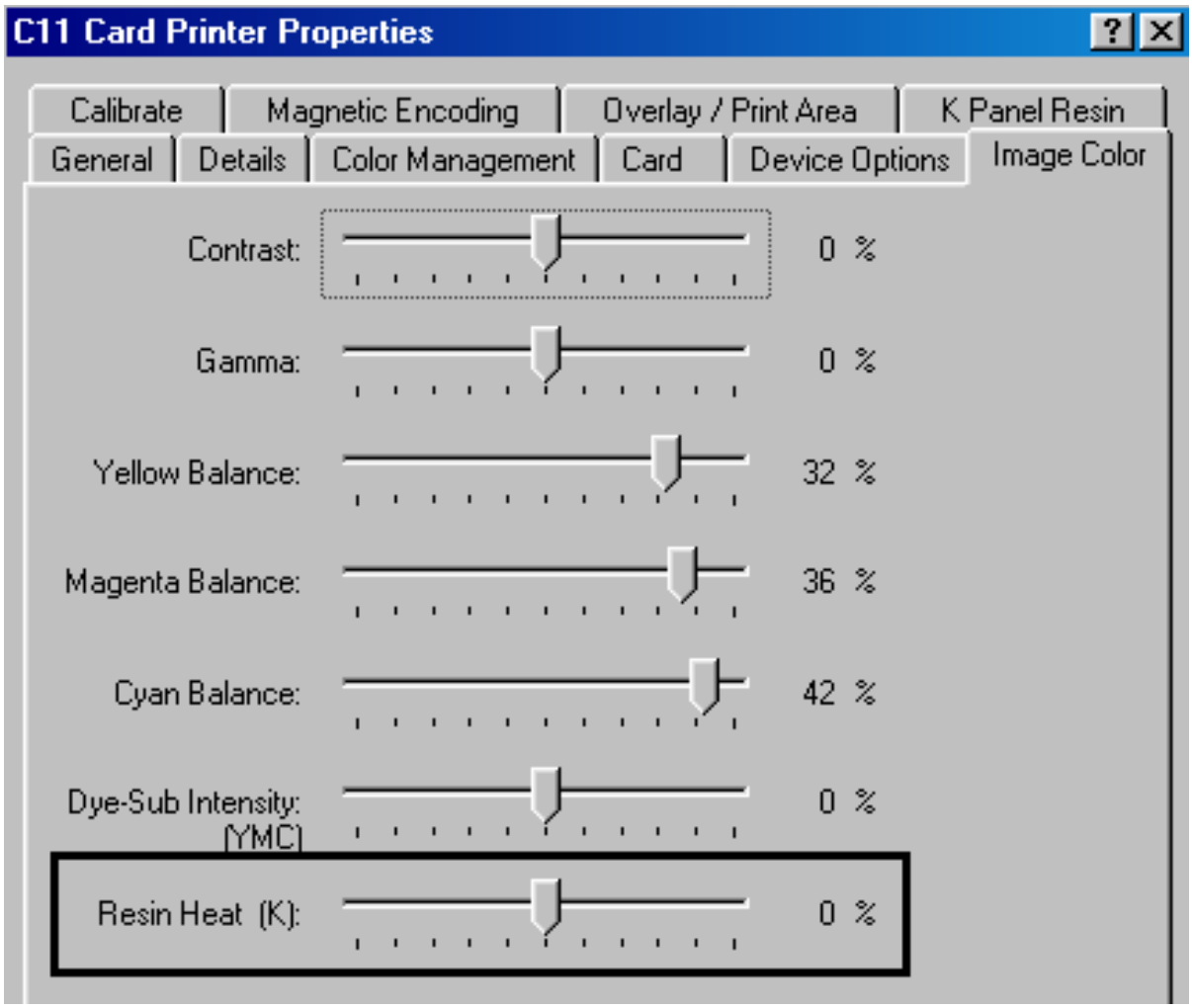
Step	Procedure
3	Reduce the Image Darkness. See Using the Image Darkness option in Section 3, page 80.

Resolving the Excessive Resin Printing problems

Symptom: Black resin text and barcodes appear smeared or too thick.

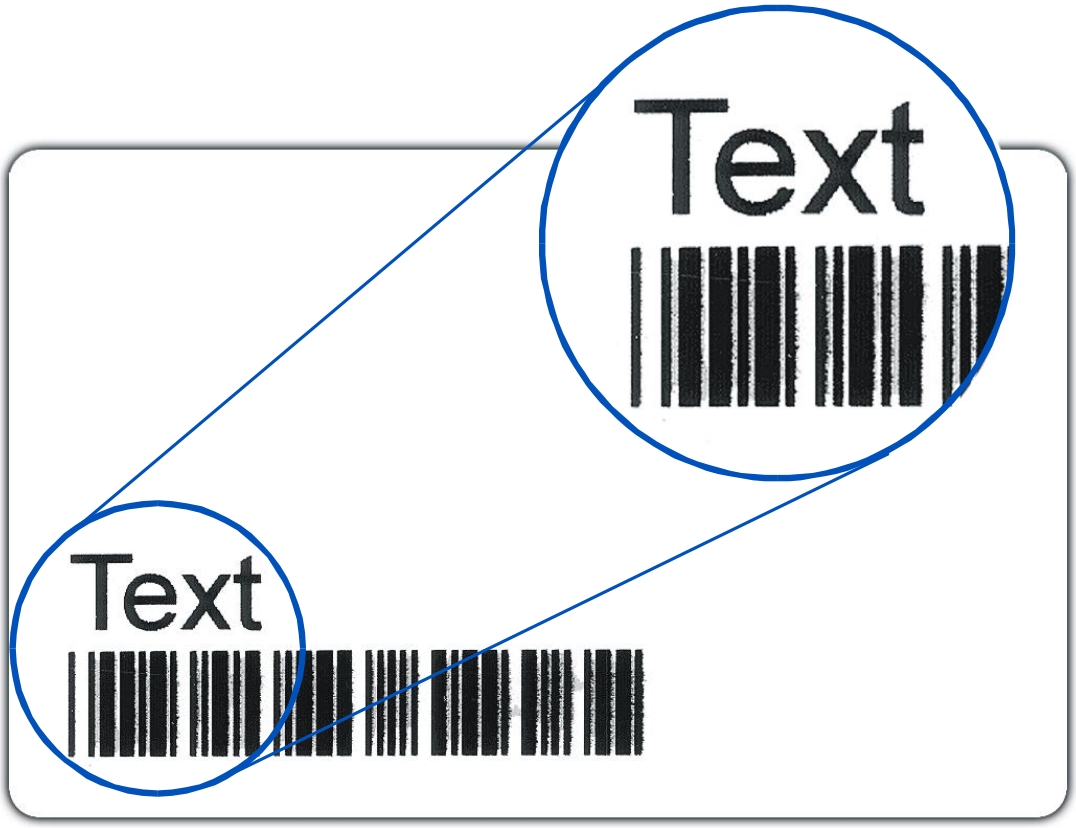
Step	Procedure
1	Reduce the Resin Heat setting within the Image Color tab of the Printer Driver. See the Using the Image Color tab procedure in Section 3, page 95.

Continued on the next page



Resolving the Excessive Resin Printing problems (continued)

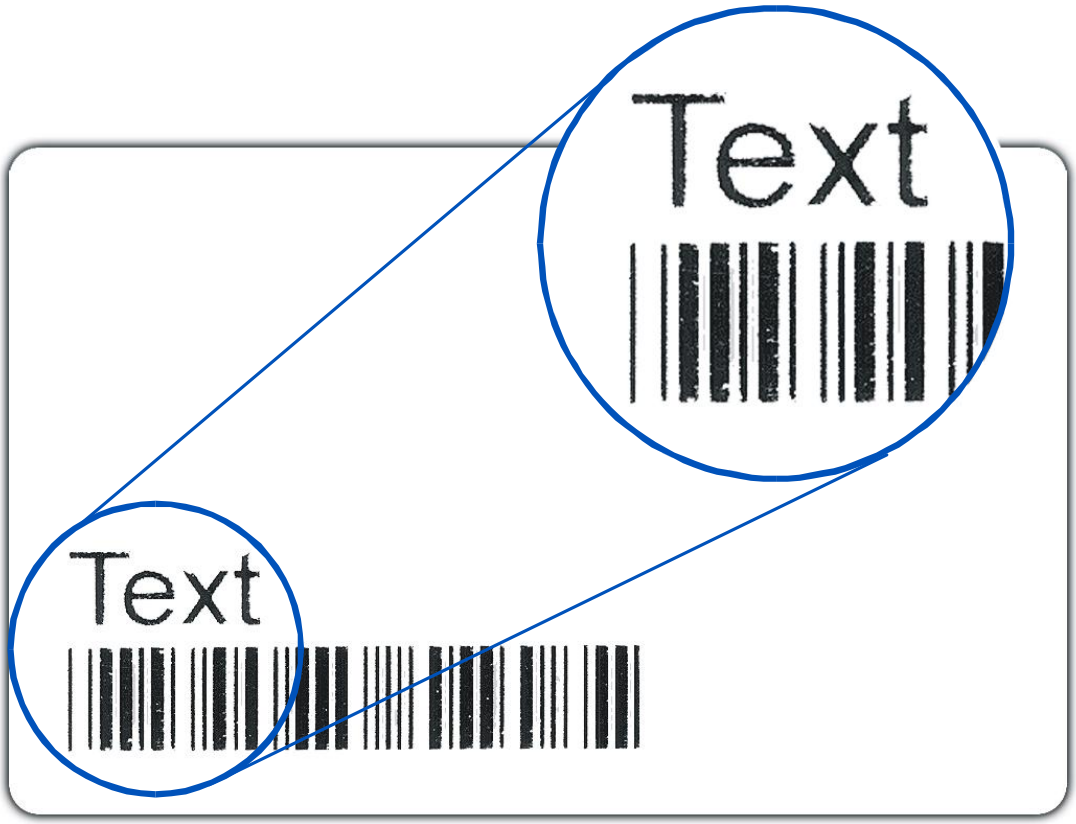
Step	Procedure
2	Reduce the Image Darkness. See Using the Image Darkness option in Section 3, page 80.



Resolving the Incomplete Resin Printing problems

Symptom: Black resin text and barcodes appear faded or too light.

Step	Procedure
1	Increase the **Resin Heat** setting within the Image Color tab of the Printer driver. See the Using the Image Color tab procedure in Section 3, page 95.
2	Increase the **Image Darkness**. See Using the Image Darkness option in Section 3, page 80.

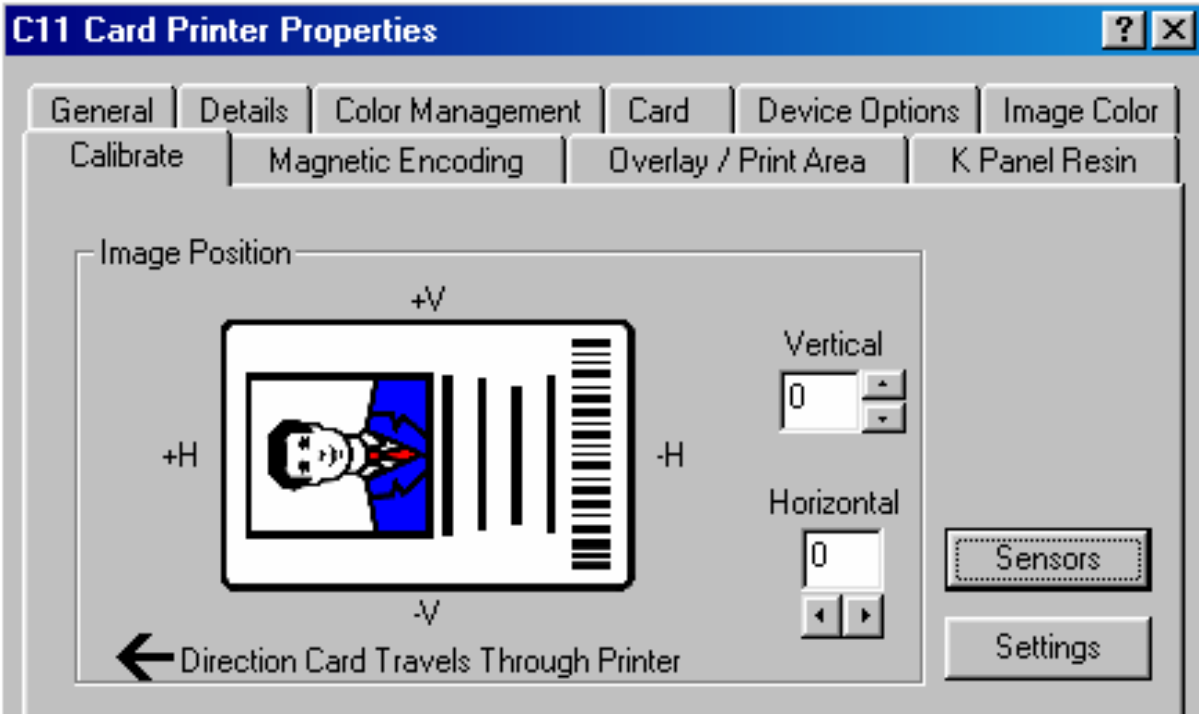


Resolving the Image Placement problems

Symptom: Printing is cut off or is not centered on the card or a white border appears.

Step	Procedure
1	Verify if the Image Position option within the Calibrate tab is set incorrectly. a. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the C11 Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the C11 Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the C11 Card Printer and select **Printing Preferences**. b. Click on the Calibrate tab. c. Adjust the **Vertical** and/or **Horizontal Image Position** settings based on where the white border is on the card.

Continued on the next page



Resolving the Image Placement problems (continued)

Step	Procedure
2	Verify if the **Image Placement Setting** is set correctly or incorrectly. See Graphic A on the next page. a. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the C11 Card Printer Icon and select **Properties**. • If using Windows NT 4.0 right click on the C11 Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the C11 Card Printer and select **Printing Preferences**. b. Click on the Calibrate tab. c. Click on the **Settings** button. • If the white border is on the leading edge of the card, adjust the Image Placement value by –2. • If the white border is on the trailing edge of the card, adjust the Image Placement value by +2. d. Click on **OK**. e. Run a self-test. f. If the white border is diminished, continue the adjustment until it is gone.
3	Adjust the Card Guide Bar (as needed). See Graphic B on the next page. a. Open the Top Print Cover. b. Loosen the two screws that hold the Card Guide Bar in place. c. Carefully move the Card Guide Bar (**Note:** Ensure that all adjustments leave the Card Guide Bar equidistant from the rear side plate of the Printer.)

Resolving the Image Placement problems (continued)

Graphic A

Graphic B

Resolving the Poor Image Quality problems

Symptom: Photos on the cards look pixilated or grainy, as shown below.

Step	Procedure
1	Use high-resolution, 24-bit color images to always capture an image: • at a 24-bit color setting • at 300 dpi • at the same size that it will be printed on the card, as captured either with a scanner or with a digital camera If a small or low-resolution image is stretched or blown up, a pixilated or grainy effect will occur when printing, as shown below (rightside).

Good

Bad

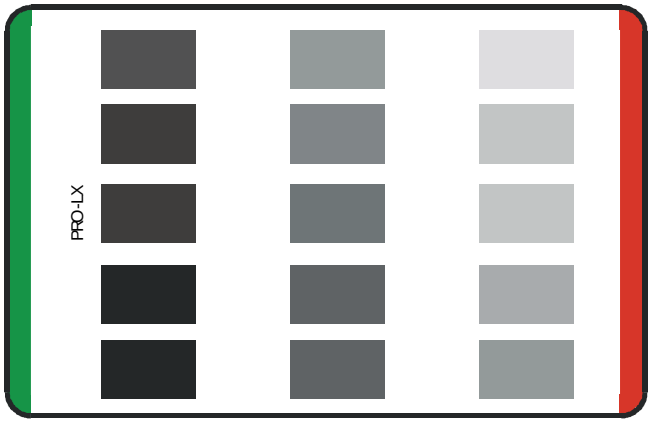
Running the Self Test

Perform a self-test after (a) an initial setup of the Printer, (b) a calibration procedure has been conducted or (c) a part has been replaced to check for proper Printer operation.

Step	Procedure
1	Verify that a full-color ribbon is installed and that cards are properly loaded. **Caution:** If the power is ON, disconnect the Power Cable from the Printer's rear panel.
2	Press and hold the **Pause/Resume** button.
3	While holding down the **Pause/Resume** button, plug the power cable back into the Printer.
4	The Printer will print a 3-color process gray scale on the front, flip the card and print the monochrome black panel on the back. The overlay pass is not printed during the Self-test.

Running the Standard Self Test Print

This card will be printed.



Using the DIP Switch (Self-test)

Step	Procedure
1	Activate any of these diagnostic tests and Calibration modes. See Running the Self Test in Section 2, page 67. During the activation of the Self-test, the Printer will: • Detect the change to the DIP Switch Settings. See Using the DIP Switch Self Test in Section 2, page 68. • Operate the Printer in that selected Test or Calibration mode.
2	Return all the DIP switches back to their normal OFF position once the tests are completed.
3	Leave the associated DIP switches activated to operate the Printer this way or temporarily use the settings to test a particular Printer operation. (**Note:** When altering a particular mode-of-operation (e.g., disabling the laminator or magnetic verification), it will affect Printer operation while printing from a computer.)
4	When completed, turn OFF the power to the Printer to reset the operating mode of the Printer. • The first illustration (below) shows all eight (8) switches in the normal OFF position. • The second illustration (below) shows Switches No. 1,2 and 3 in the ON position. (**Note:** The Ribbon Sensor calibration without the need of a PC). (**Note:** Refer to the DIP Switch Settings table on the next page for additional diagnostic selections.)

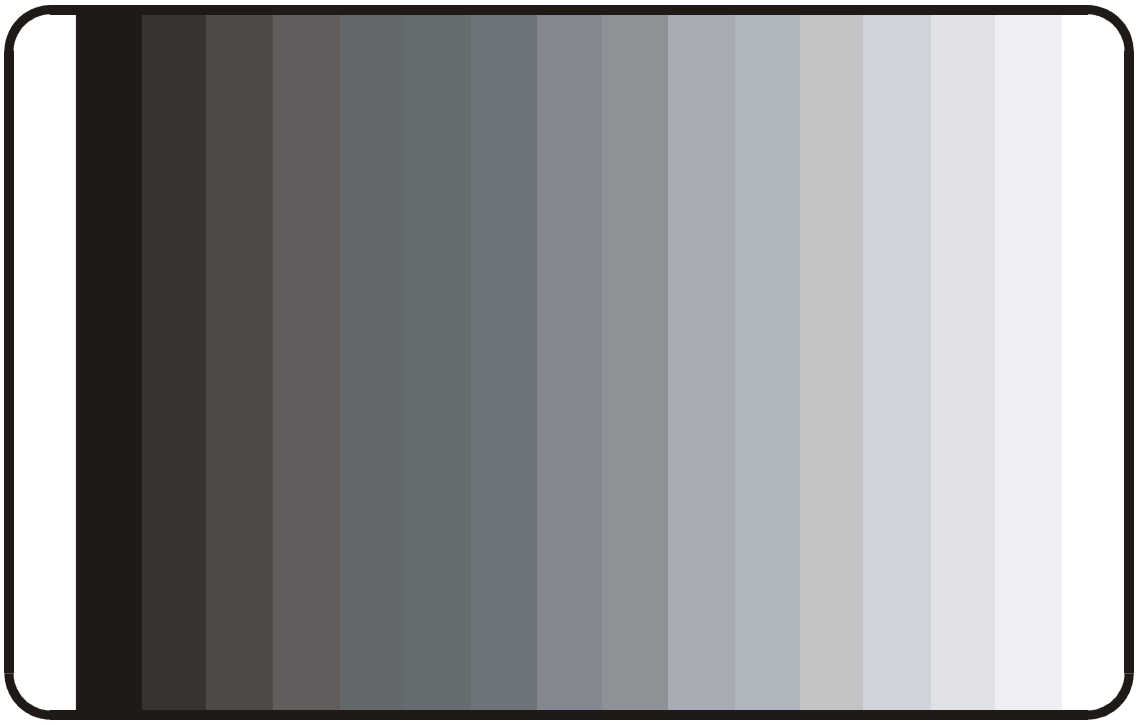
Setting the DIP Switch Settings

The capital letter "**X**" indicates that the switch should be set to ON or DOWN.

SW1	SW2	SW3	SW4	Diagnostic modes
X	X	X	X	Test5x3, Wrinkle, Gray15x3, ResTest, Gray15K, Steps is a standard YMCKO test card.
		X	X	Mag123A is a mag-only test card (records on the Magnetic Stripe).
	X			The RibTest calibrates the Ribbon Color Sensor (none or anything except Mono Resin).
	X	X	X	The ResinTest is a premium resin test card.
X	X	X	X	The TestCore allows reading of the core pins. In this mode, the Printer will beep every time a core pin is detected in the Ribbon Roll.
	X	X	X	RegTest is for YMCKO.

Running the 15-Shade Self Test

This is the Self-test that appears when specific changes are made to the DIP Switch Settings.

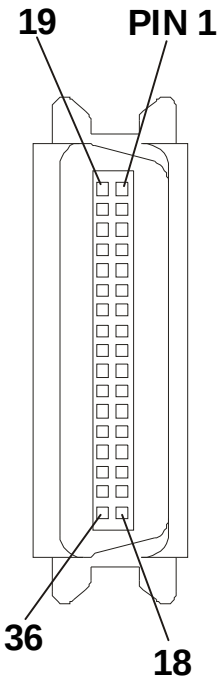


Interfacing Information

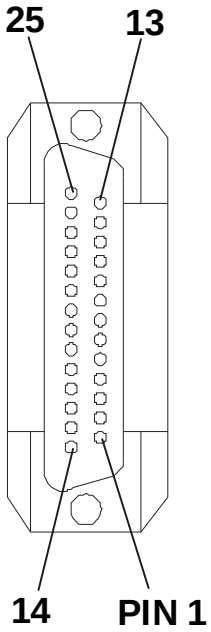
The Printer is equipped with a standard 8-bit Centronics-type Parallel Data Communications Port. (**Note:** The Printer's Parallel Interface Connector is a standard 36-pin Amp type with two metal-wire retaining clips. It mates with a standard PC to Printer parallel cable.)

Caution: For best results, keep the Interface Cable to less than six (6) feet.

Reviewing the Pin Assignments



WIRE DIAGRAM	
DB36P	**DB25P**
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
32	15
31	16
36	17
19 Through 30	19 Through 25
Shell	Shell



Reviewing the Centronics Parallel Pin Assignments

Signal Funtion	Bit Name	DB-25 M 1284A Pin #	Centronics M 1284B Pin #
nStrobe	C0	1	1
Data Bit 0	D0	2	2
Data Bit 1	D1	3	3
Data Bit 2	D2	4	4
Data Bit 3	D3	5	5
Data Bit 4	D4	6	6
Data Bit 5	D5	7	7
Data Bit 6	D6	8	8
Data Bit 7	D7	9	9
nAck	S6	10	10
Busy	S7	11	11
PaperEnd	S5	12	12
Select	S4	13	13
nAutoLF	C1	14	14

Continued on the next page

Reviewing the Centronics Parallel Pin Assignments (continued)

Signal Funtion	Bit Name	DB-25 M 1284A Pin #	Centronics M 1284B Pin #
nError (nFault)	S3	15	32
nInit	C2	16	31
nSelectIn	C3	17	36
Grnd Rtn		18	19
Grnd Rtn		19	20
Grnd Rtn		19	21
Grnd Rtn		20	22
Grnd Rtn		20	23
Grnd Rtn		21	24
Grnd Rtn		21	25
Grnd Rtn		22	26
Grnd Rtn		22	27
Grnd Rtn		23	29
Grnd Rtn		24	28
Grnd Rtn		25	30

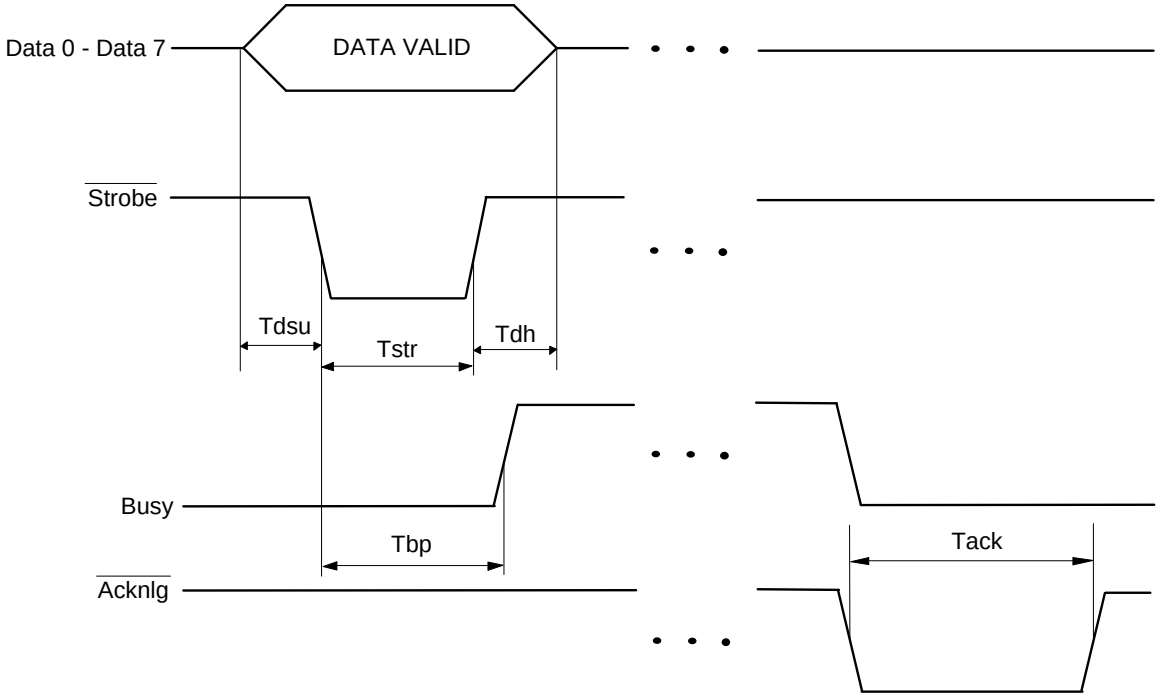
Continued on the next page

Reviewing the Centronics Parallel Pin Assignments (continued)

Ch. Grnd			17
Perif. Hi.			18
Unused			15
Unused			33
Unused			34
Unused			35

Reviewing the Printer Timing Diagram

The timing diagram (below) illustrates the data and handshake lines during the transfer of one data byte to the Computer.



Reviewing the Printer Timing

Interval	Description	Minimum Value
Tdsu	Data setup time	0.5 µs
Tstr	Data strobe width	
1 µs		
Tack		
Acknlg pulse width		
3.75 µs		
Tdh	Data hold time	0.5 µs
Tsb		
Busy delay time from data strobe		
0.5 µs (max.)		

Section 3: Printer Adjustments

Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger:	**Failure to follow these installation guidelines can result in death or serious injury.** Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair procedures, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these procedures.
Caution:	**This device is electrostatically sensitive**. **It may be damaged if exposed to static electricity discharges.** Information that raises potential electrostatic safety issues is indicated by a warning symbol (as shown to the below). • **To prevent equipment or media damage**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent equipment or media damage**, observe all established Electrostatic Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. • **To prevent equipment or media damage**, always wear an appropriate personal grounding device (e.g., a high quality wrist strap grounded to avoid potential damage). • **To prevent equipment or media damage**, always remove the Ribbon and Cards from the Printer before making any repairs, unless otherwise specified. • **To prevent equipment or media damage**, take jewelry off of fingers and hands, as well as thoroughly clean hands to remove oil and debris before working on the Printer.

Adjusting the Magnetic Encoding Head

Use this procedure to adjust the coercivity of the Magnetic Encoding Head.

Tools Needed: Phillips Head Screwdriver, Small Standard Screwdriver, Digital Voltmeter

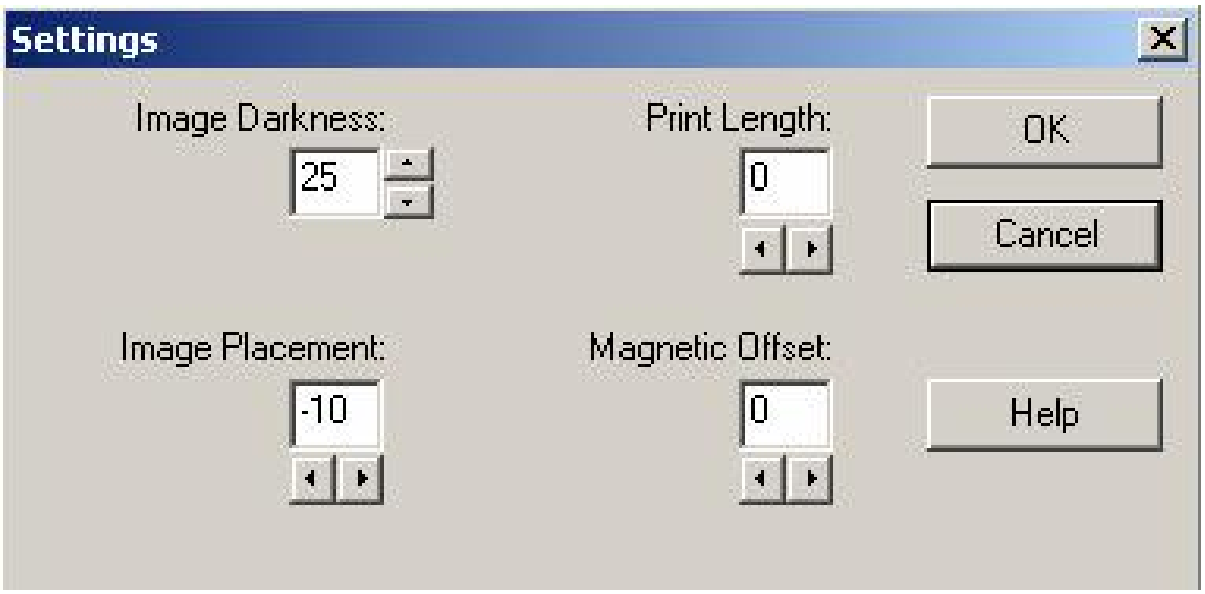
Steps	Procedure
1	**Caution:** Turn off the Printer and unplug the power cord from the Printer.
2	Open the Upper Imaging Assembly.
3	Loosen the top two corner screws (130987) found just behind the top edge of the Rear Cover.
4	Close the Upper Imaging Assembly.
5	Remove the screw (130987) by the Card Exit Ramp.
6	Remove the Rear Cover.
7	Locate the Potentiometer labeled RP4.
8	Locate the test point labeled TP8
9	Place the positive lead of the voltmeter on TP8. Place the negative lead on ground.
10	Adjust RP4 until the voltage on TP8 reads 6.0 volts DC on the voltmeter for High Coercivity or 2.5 volts DC on the voltmeter for Low Coercivity.

C11 Print Driver Options

Using the Settings dialog box

Access the Settings dialog box via the **Settings** button on the Calibrate tab. Use the adjustment mode to change the Printer's internal settings for overall Image Darkness, Image Placement, Print Length and Magnetic Offset. (**Note:** The Card Printer is equipped with an internal adjustment mode programmable through the Settings dialog box. This dialog box is accessible only if the Printer is powered ON, in Ready Mode and is properly connected to the PC.)

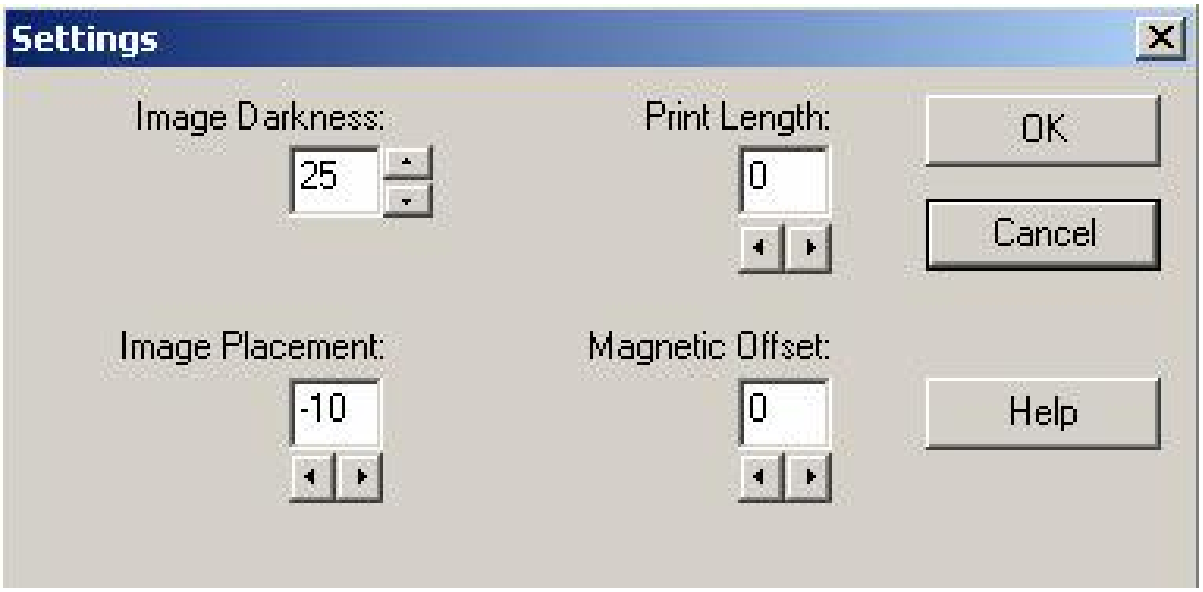
Step	Procedure
1	Change these settings according to the original settings recorded on a label attached to the Printer's base plate or rear panel or refer to the remainder of this Section. (**Note:** These can be helpful to get back to the Printer's original baseline settings.) **Caution!** These settings are optimized at the factory and in most cases, they will not need to be changed.



Using the Image Darkness option

Use this option to set the overall darkness of the printed image by increasing or decreasing the amount of heat used by the Printhead when printing.

Step	Procedure
1	Lighten the printed image by clicking the down arrow ▼ to enter a negative value and decrease the amount of Printhead heat. **OR** Darken the image by clicking the up arrow ▲ to enter a positive value and increase the amount of Printhead heat. **Maximum Adjustment Range:** The maximum adjustment range is ±100. **Caution #1:** For best results, make slight adjustments of only ± 4 to avoid accidentally over-adjusting the Printhead heat. **Caution #2:** If the positive value is set too high, the print ribbon may jam or even break.

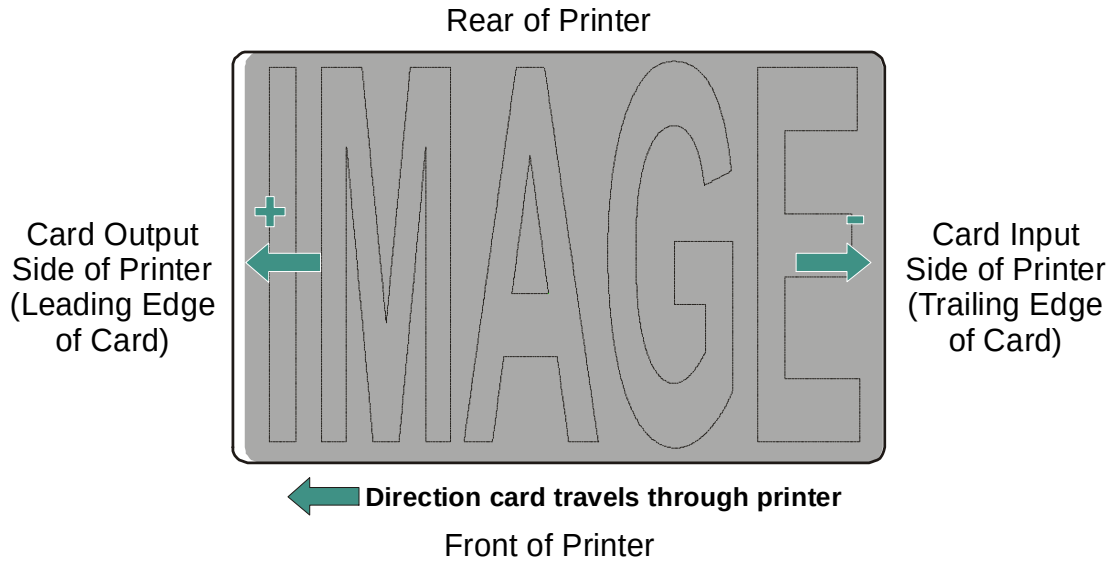


Using the Image Placement option

Use this option to adjust the lengthwise or horizontal position of the printed image on a card so it appears centered. (**Note:** When adjusting this value, keep in mind that cards always remain in the same landscape orientation while moving through the Printer.)

The diagram (below) represents how the printed image will move in relation to the fixed card position as a positive or negative Image Placement value is entered.

Step	Procedure
1	Click on the left arrow ◂ to enter a positive value to move the printed image toward the leading edge of the card or the card output to the side of the Printer. **OR** Click on the right arrow ▸ to enter a negative value to move the printed image toward the trailing edge of the card or the card input to the side of the Printer. • **Printed Image Direction:** The arrows on these buttons indicate the direction the printed image will move on the card. • **Maximum Adjustment Range:** The maximum adjustment range is ±100. As a rule, 10 equals about .030"/. 8mm, which is about the same as the thickness of a standard CR-80 size card. **Caution:** If positive value is set too high, the print ribbon may break.

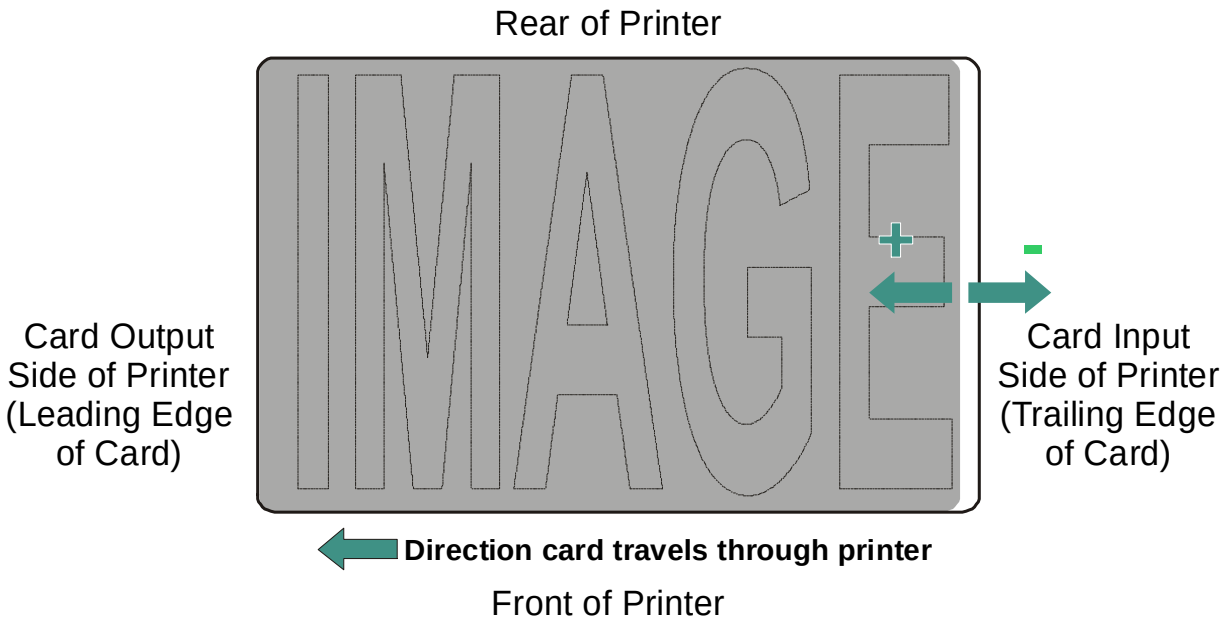

Rear of Printer
Card Output Side of Printer (Leading Edge of Card)
IMAGE
Card Input Side of Printer (Trailing Edge of Card)
Direction card travels through printer
Front of Printer

Using the Print Length option

Use this option to reduce or increase the overall printable area in order to optimize edge-to-edge printing toward the trailing edge of a card. (**Note:** When adjusting this value, keep in mind that cards always remain in the same position while moving through the Printer.)

The diagram (below) represents how the end of form will move in relation to the fixed card position as a positive or negative Print Length value is entered.

Step	Procedure
1	Click on the left arrow ◂ to enter a positive value to reduce the print length and move the end of the printable area more toward the leading edge of the card. **OR** Click on the right arrow ▸ to enter a negative value to increase the print length and move the end of the printable area more toward the trailing edge of the card. • **Printed Image Direction:** Notice the arrows on these buttons indicate the direction the length of the printable area will move on the card. • **Maximum Adjustment Range:** The maximum adjustment range is ±100. As a rule, 10 equals about .030"/. 8mm, which is about the same as the thickness of a standard CR-80 size card.)

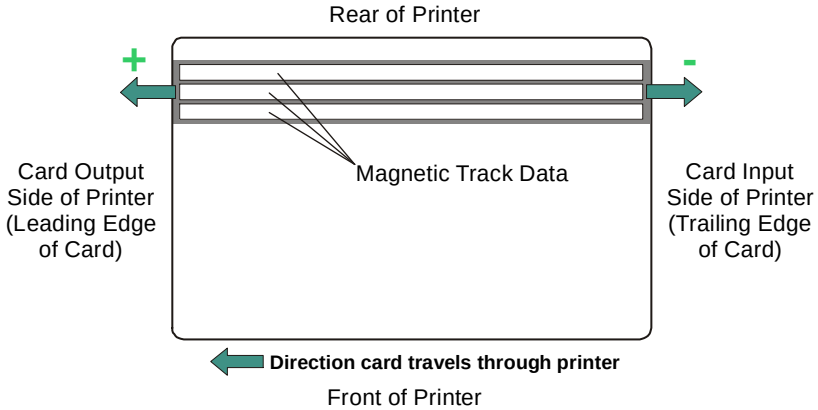

Rear of Printer
IMAGE
+
-
Card Output Side of Printer (Leading Edge of Card)
Card Input Side of Printer (Trailing Edge of Card)
Direction card travels through printer
Front of Printer

Using the Magnetic Offset option

Use this option only if the Printer has a built-in Magnetic Stripe encoder. (**Note:** If so, use this option to shift the starting point of where the Printer will begin encoding the magnetic track data on a card's Magnetic Stripe. When adjusting this value, keep in mind that a card and its Magnetic Stripe will always remain in the same relative position as the card travels through the Printer.)

The diagram (below) represents how the magnetic data will move in relation to the fixed position of a card's Magnetic Stripe as a positive or negative Magnetic Offset value is entered. (**Note:** For this diagram, imagine that the card is transparent and the card's mag stripe can be seen through the top or front side of the card.)

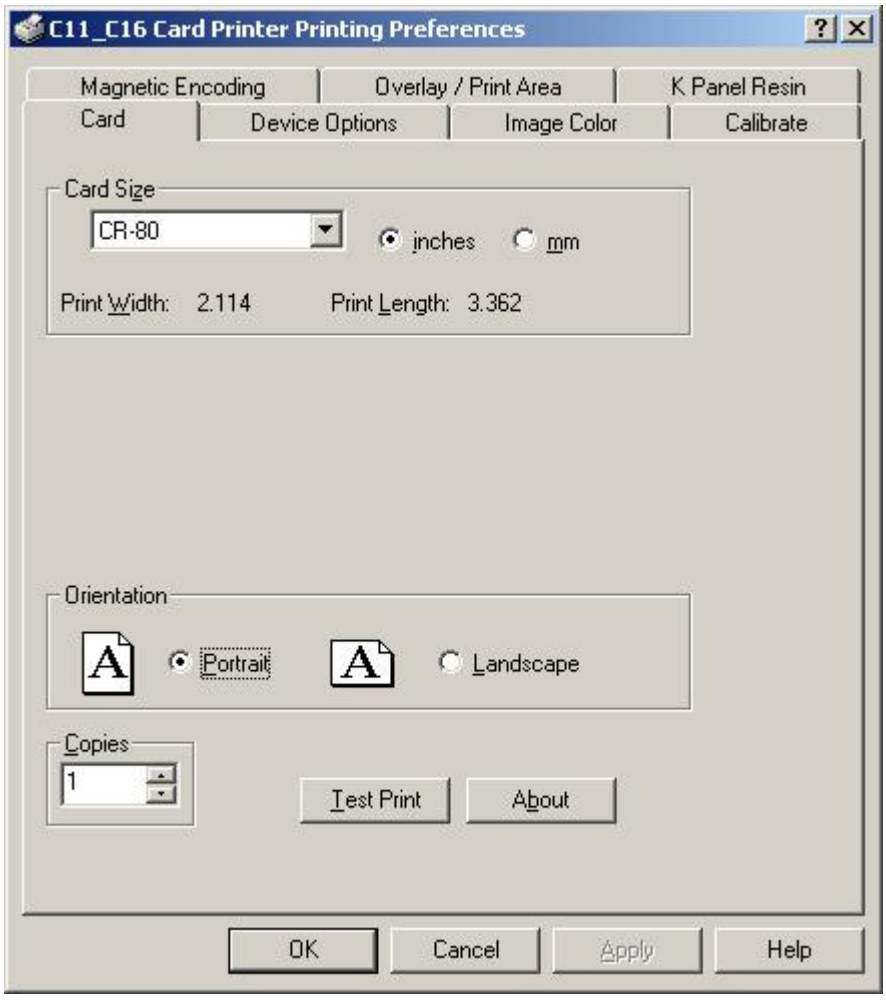
Step	Procedure
1	Click on the left arrow ◂ to enter a positive value to move the start of the magnetic data more toward the leading edge of the card or the card output to the side of the Printer. **OR** Click on the right arrow ▸ to enter a negative value to move the start of the magnetic data toward the trailing edge of the card or the card input to the side of the Printer. • **Magnetic Data Direction:** The arrows on these buttons indicate the direction the magnetic data will move on the card's Magnetic Stripe. • **Maximum Adjustment Range:** The maximum adjustment range is ±100. As a rule, 10 equals about .030"/. 8mm.) (**Note:** Keep this in mind when adjusting this option to avoid over-adjusting.) **Caution:** If the negative value is set too high, the Printer may start encoding before the card's Magnetic Stripe reaches the encoding head.


Rear of Printer
+
-
Card Output Side of Printer (Leading Edge of Card)
Magnetic Track Data
Card Input Side of Printer (Trailing Edge of Card)
Direction card travels through printer
Front of Printer

Using the Card tab

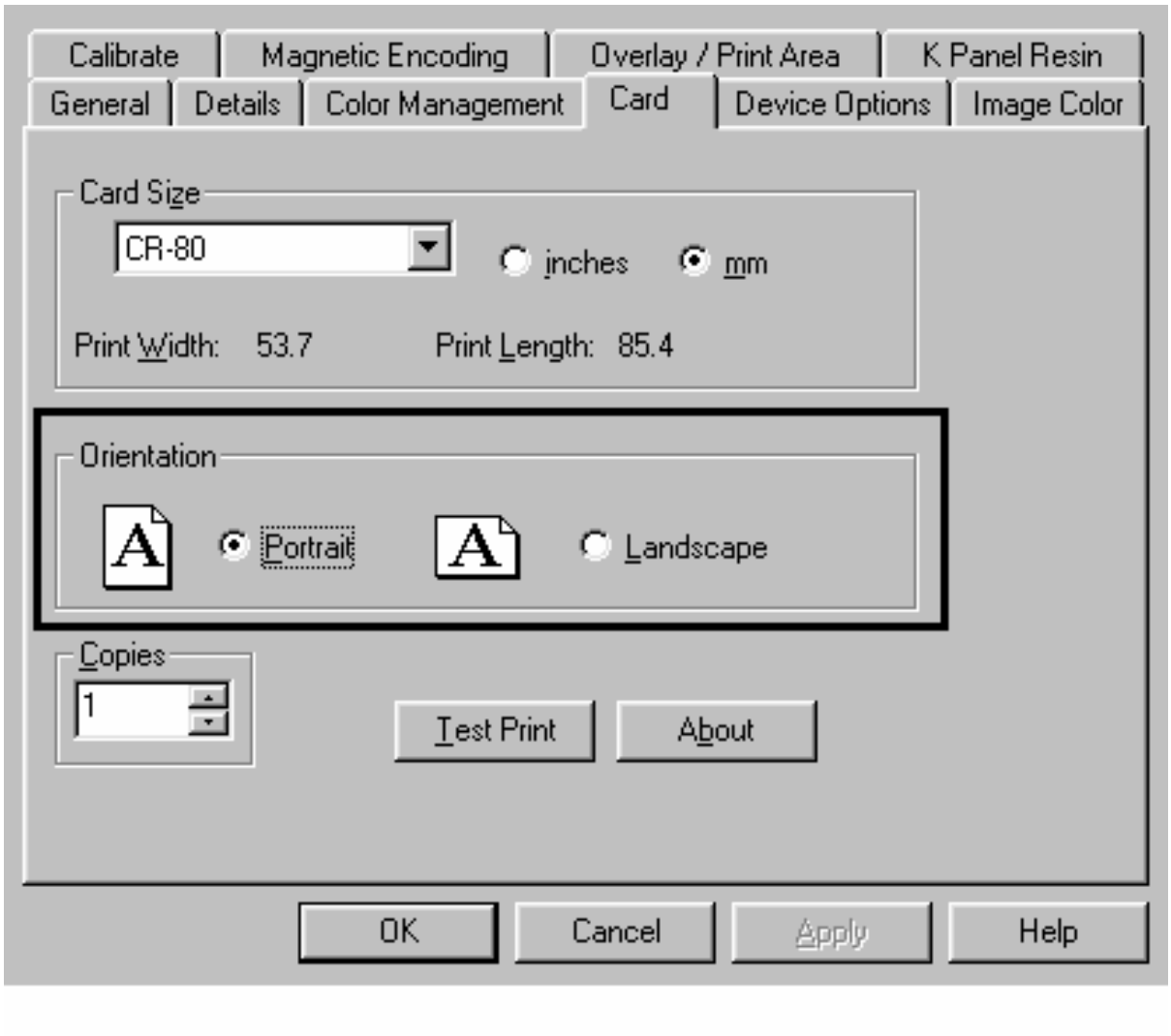
Adjusting the Card Size Option

Step	Description
1	Click on the **inches** or **mm** option to choose the desired unit of measurement. (**Note #1:** When designing a card format, always set the card size or page size within the card design program to the exact dimensions of a CR-80 card.) (**Note #2:** The Card Size indicates that the Printer accepts standard, "credit card" size CR-80 (ISO ID-1) cards. The dimensions of the total print area for this card size appear in the Print Width and Print Length boxes.)



Adjusting the Orientation Option

Step	Description
1	Select **Portrait** under Orientation to cause the card to print in a vertical orientation. **OR** Select **Landscape** under Orientation to cause the card to print in a horizontal orientation. (**Note:** An icon illustrating a printed card helps represent the difference between the two.)

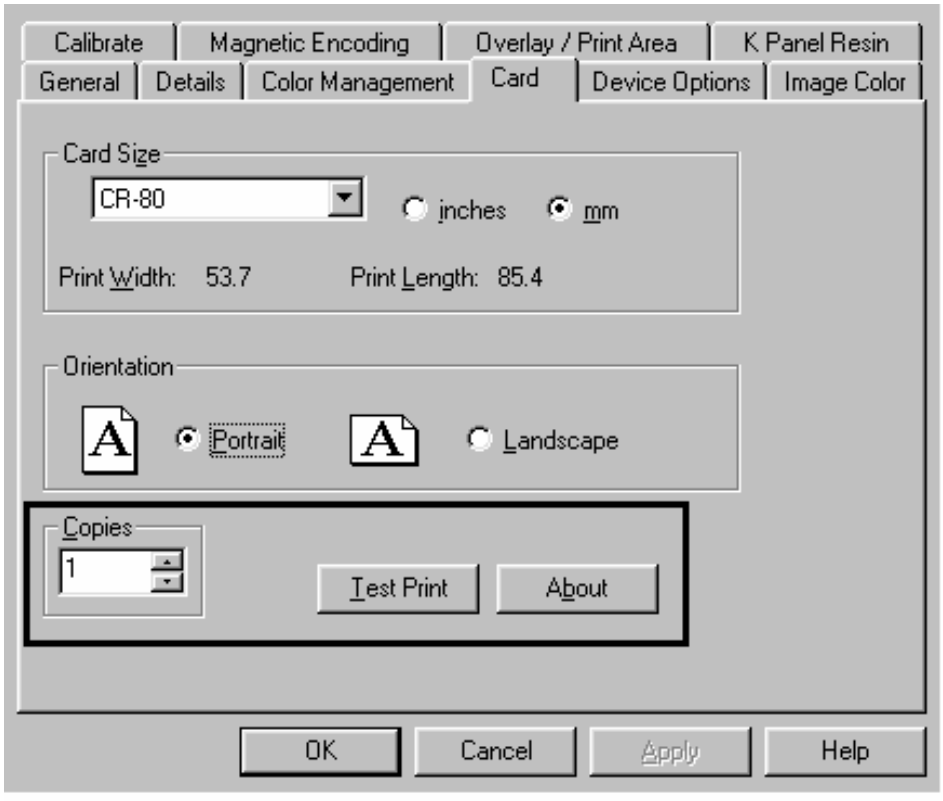


Using the Copies Option

Step	Description
1	Specify the number of copies to be printed under **Copies**.

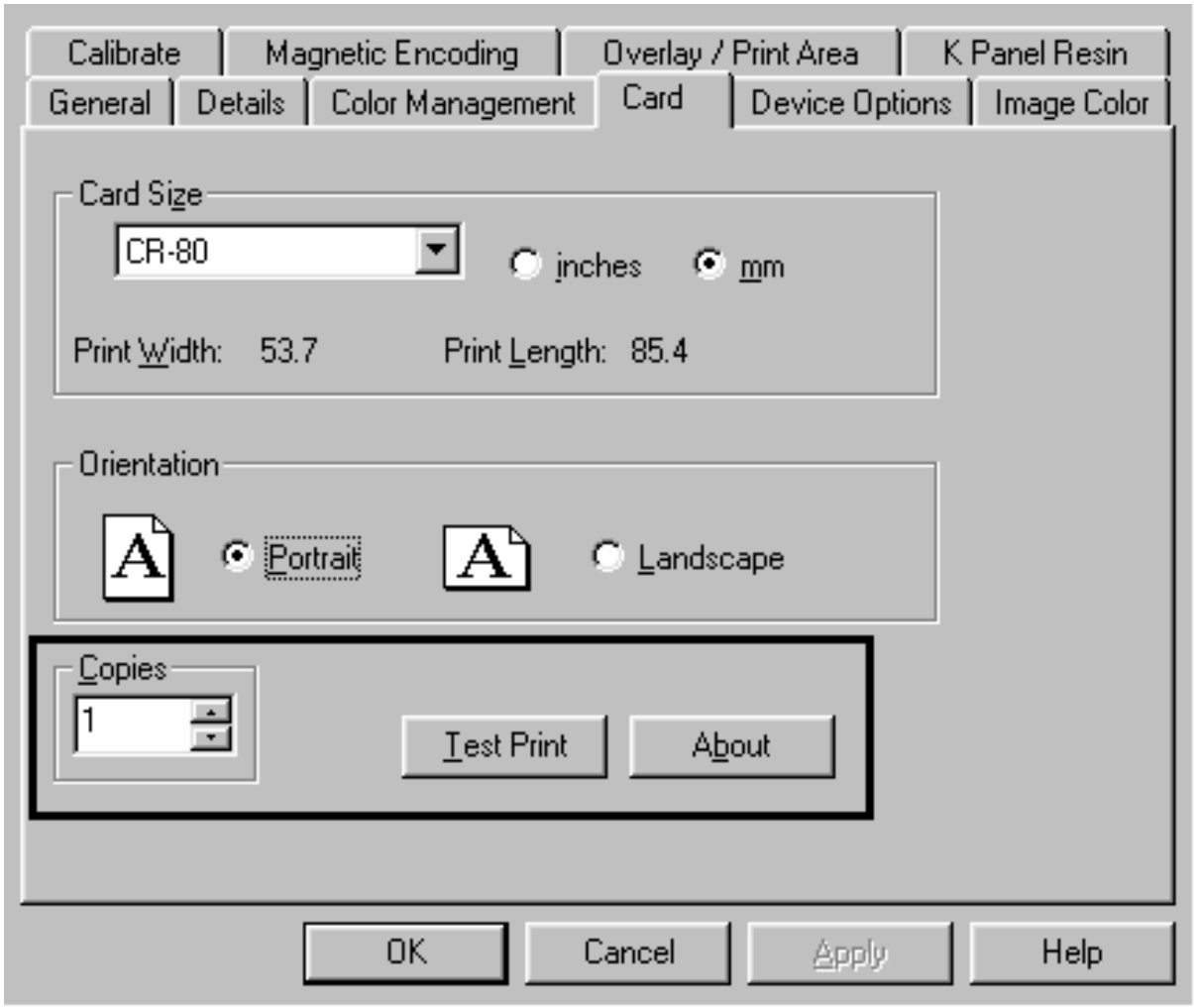
Using the Test Print button

Step	Description
1	Click on the **Test Print** button to send a simple self-test print to the Printer. • Ensure that a full-color print ribbon is installed for C11 or a monochrome ribbon installed for M11. • Ensure that the computer is effectively communicating with the Printer and that the Printer is functioning properly.



Using the About button

Step	Description
1	Click on the **About** button to open a dialog box containing the copyright and version information about this Printer driver software.

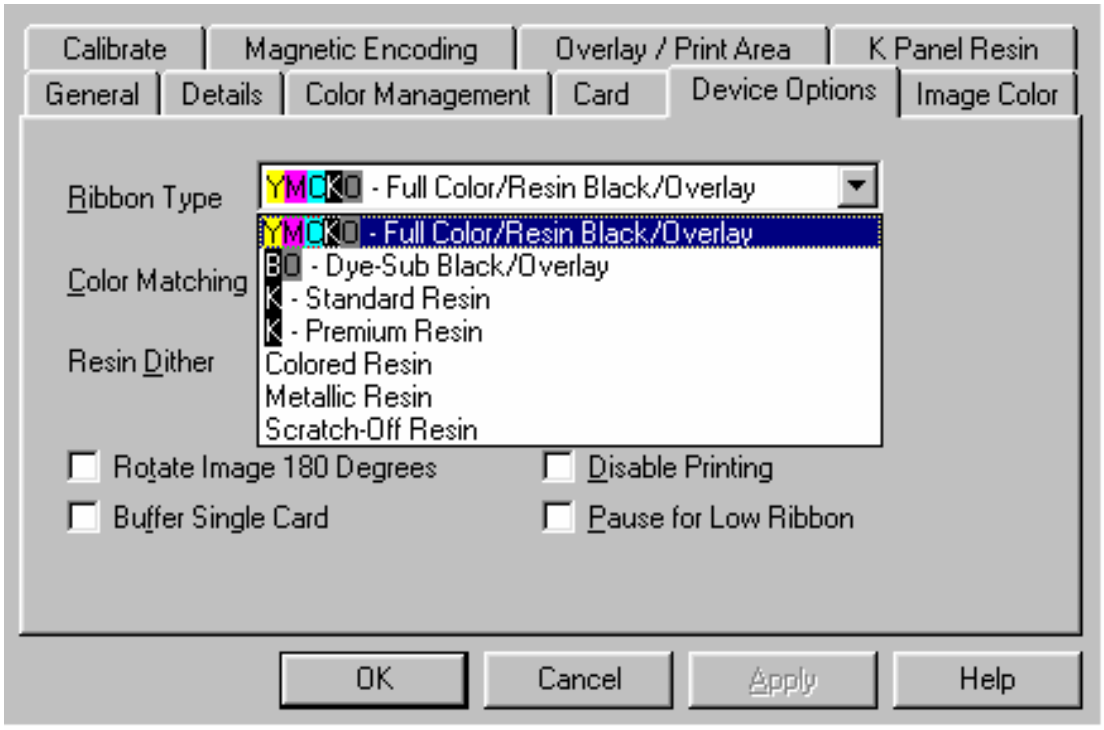


Using the Device Options tab

Adjusting the Ribbon Type option

Use the Ribbon Type option to select print ribbons.

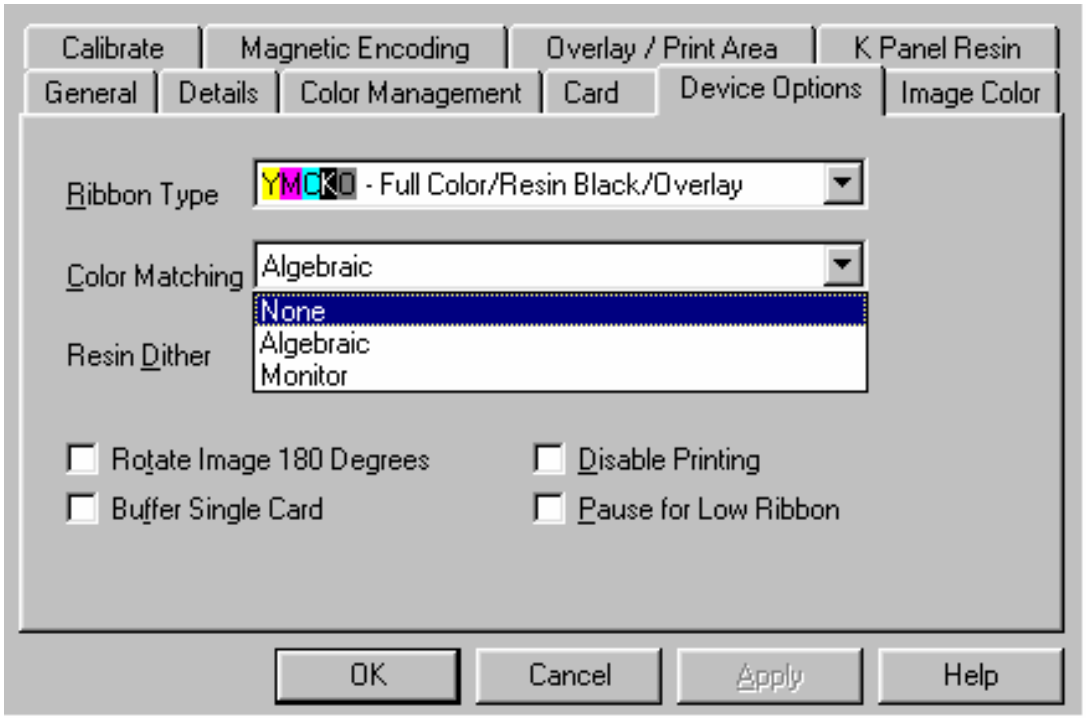
Step	Description
1	Select the appropriate print **Ribbon Type** option from the dropdown menu for the type of print ribbon in use. • YMCKO – Full Color/Resin Black/Overlay • BO – Dye-Sub Black/Overlay • K – Standard Resin • K – Premium Resin • Colored Resin • Metallic Resin • Scratch-Off Resin



Adjusting the Color Matching option

Use the **Color Matching** dropdown menu to choose the color matching options which best fits the print job requirements.

Step	Description
1	Select **None** for print speed versus print color or for use of third party color matching software. **OR** Select **Algebraic** (a) for the Printer driver to make very simple, yet fast, color balance adjustments; (b) for more natural looking images without actually utilizing any specific color matching; or (c) for customized, printed coloring of the cards through the Image Color tab. **OR** Select **Monitor** for the Printer driver to make color corrections similar to the Algebraic option but through a more complex color matching algorithm. (**Note:** This option shifts colors to a different color model so the colors in the image will more closely match how they appear on the monitor.)

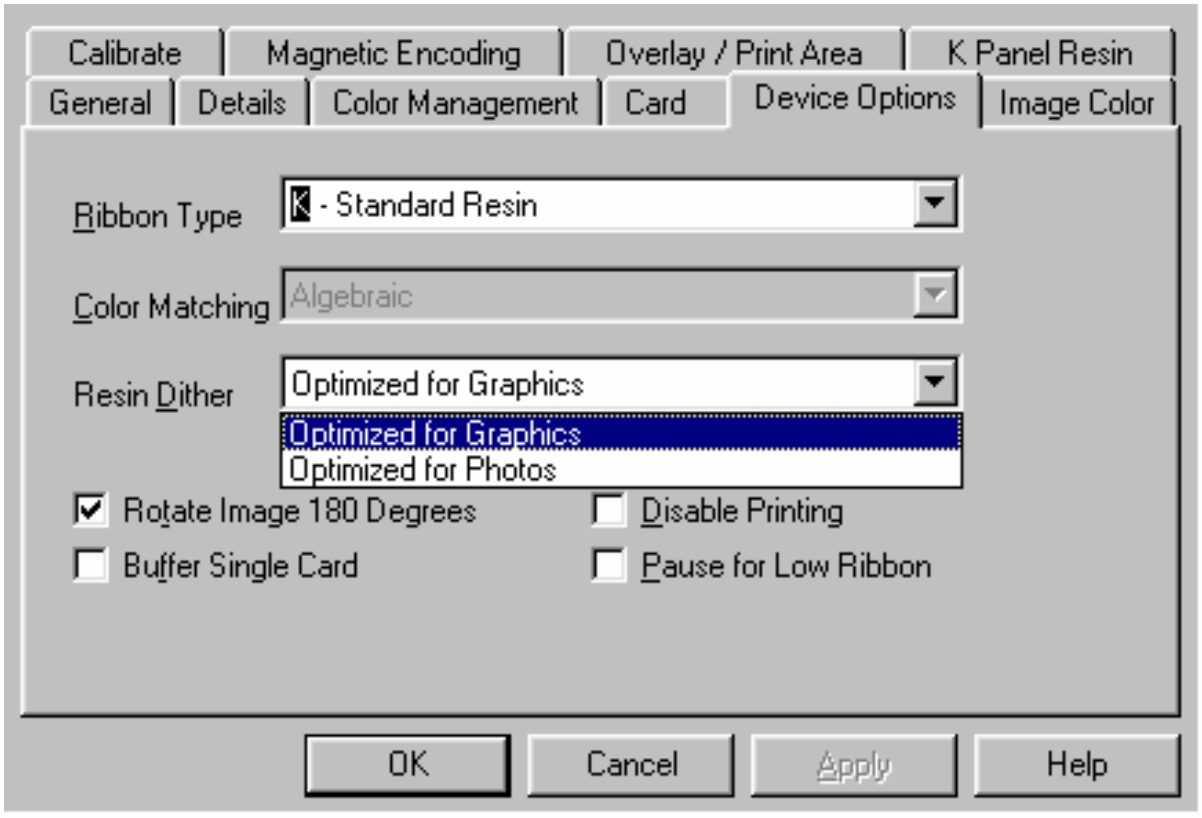


Adjusting for the Resin Dither

Select the appropriate dither method according to the type of image to be printed.

- This option only affects those objects printed on the backside of a card with the resin black panel of a YMCK or YMCKK print ribbon.)
- This option affects objects printed with a resin-only print ribbon or those objects printed on the back side of a card with the resin black panel of a YMCKO print ribbon.

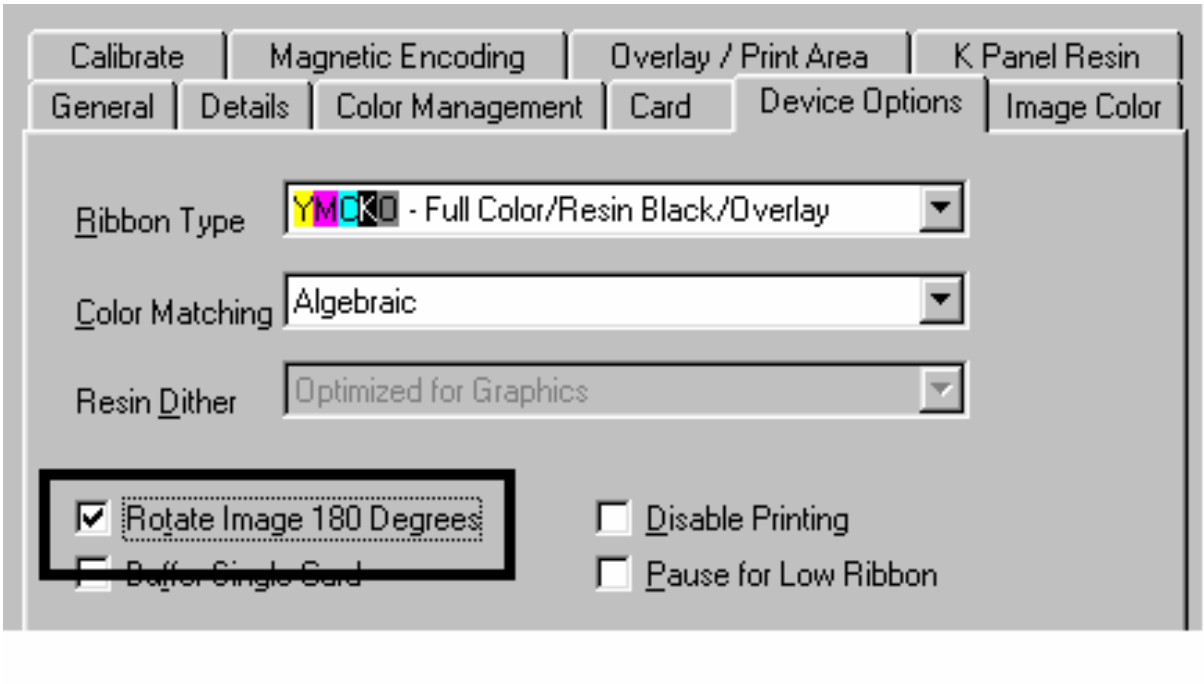
Step	Procedure
1	Select **Optimized for Photo** when printing photo quality images with resin. **OR** Select **Optimized for Graphics** when printing drawings and graphics (e.g., clipart, logos, etc.) with resin.



Using the Rotate Image 180 Degrees option

Use this option to rotate the image on the front of the card 180 degrees when printed.

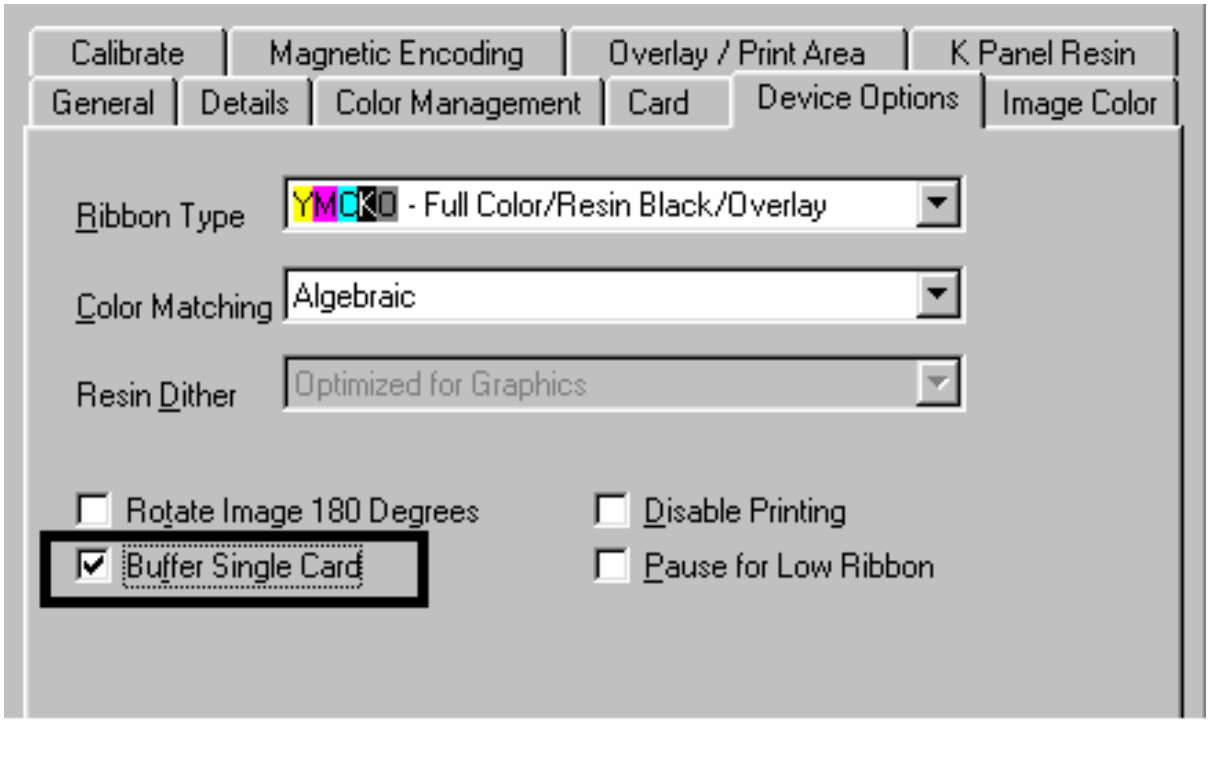
Step	Description
1	Select this option to change the position of the printed image in relation to the set location of a card's Magnetic Stripe or smart chip.



Using the Buffer Single Card option

Use this option to force the Printer's memory to buffer or hold, only one print job at a time.

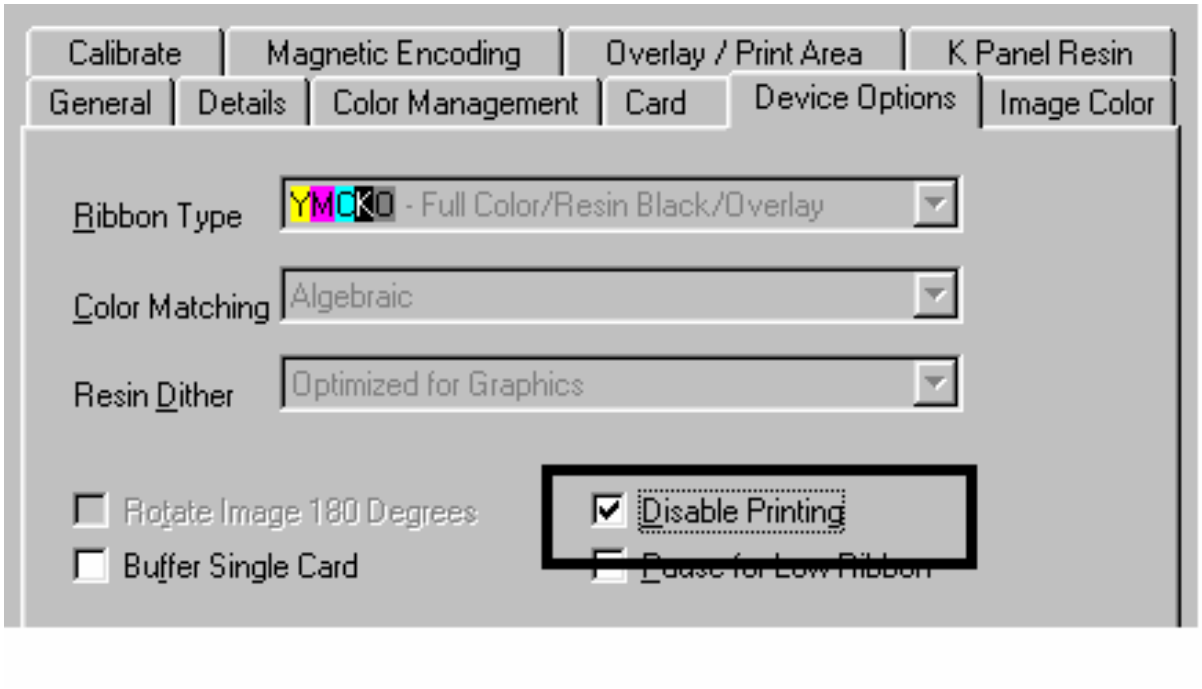
Step	Description
1	Select this option only when printing to multiple Printers that share print jobs over a network. (**Note:** This option ensures all Printers evenly share all print jobs. Normally, when this option is not selected, the Printer's memory will buffer as many print jobs as it can until the Printer's memory is full. This is ideal for most applications where Printers are not networked together.)



Using the Disable Printing option

Use this option to disable the printing capabilities of the Printer, yet still allows the Printer to encode cards.

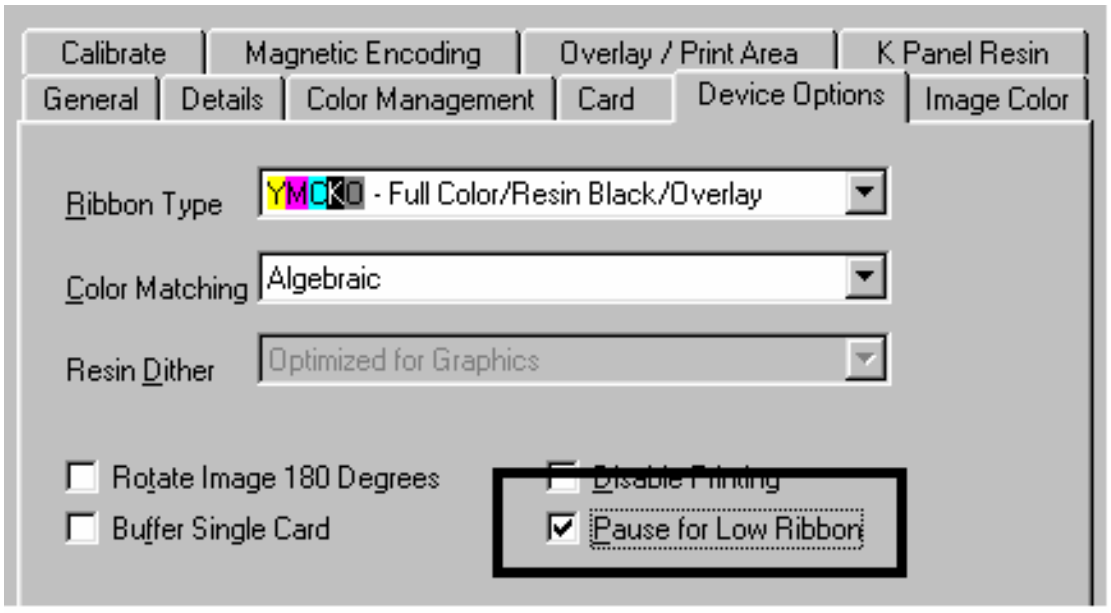
Step	Description
1	Select this option to encode or re-encode cards without wasting additional time, effort or printing supplies. (**Note:** When this option is selected, no print data will not be sent to the Printer, while all encoding instructions will be sent according to how they are configured within the software.)



Using the Pause for Low Ribbon option

Use this option as a definitive warning when running low on print ribbon. (**Note:** Select this option so the Printer will beep and pause and the Media LED will flash when approximately 10 to 20 prints remain on the print ribbon.)

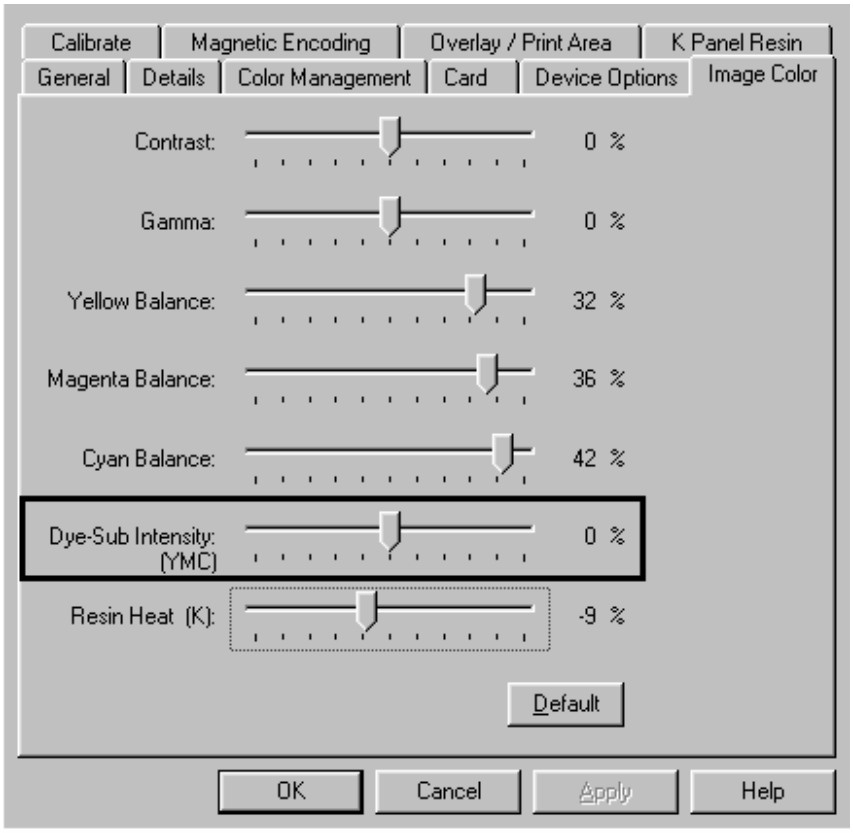
Step	Description
1	Replace the ribbon and press the Media button to continue printing with a new ribbon **OR** Leave the existing ribbon in Printer and press the **Media** button. • When this option is selected, once the **Media** button is pressed, the Printer will continue printing until the end of the ribbon and will beep once before each print job. (**Note:** It will not be necessary to press the **Media** button again to continue printing once it has been pressed initially during a batch print.) • When this option is not selected, the Printer will still beep once before each print job when approximately 10 to 20 prints remain on the print ribbon, however, the Printer will not pause. (**Note:** Instead, it will continue printing until the end of the ribbon, without user intervention.)



Using the Image Color tab

Select the **Algebraic** color matching option and then use this option to control the **Contrast** and **Gamma** of the printed image, as well as the individual color balance of **Yellow**, **Magenta** and **Cyan**. (**Note:** In most cases, the default settings of these options will suffice.)

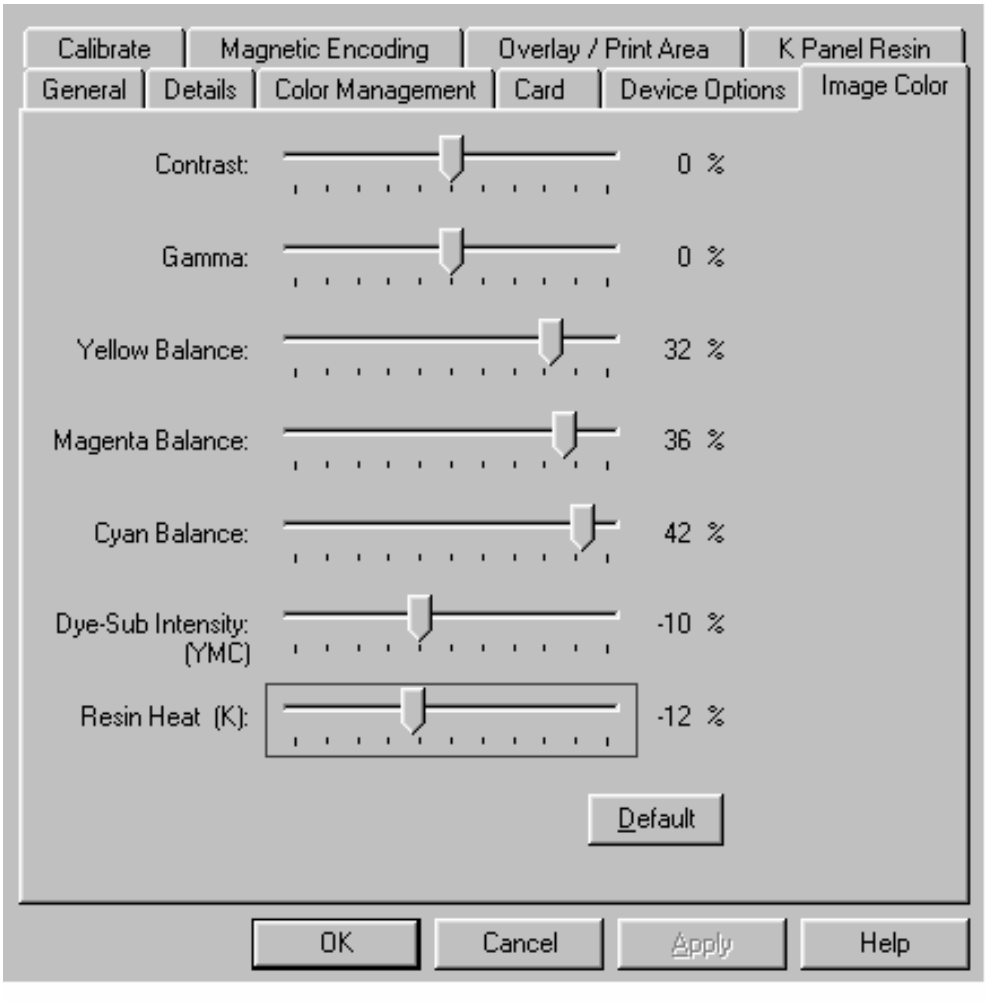
Step	Procedure
1	Control the overall darkness and lightness of the printed image by adjusting the **Dye-Sub Intensity** slide by clicking and dragging the slide's box. • Move the slide to the left to cause less heat to be used in the printing process, thus generating a lighter print. **OR** • Move the slide to the right to cause more heat to be used, thus generating a darker print. (**Note:** This slide only affects those images printed with dye-sublimation ribbon panels (YMC).)



Using the Resin Heat (K) option

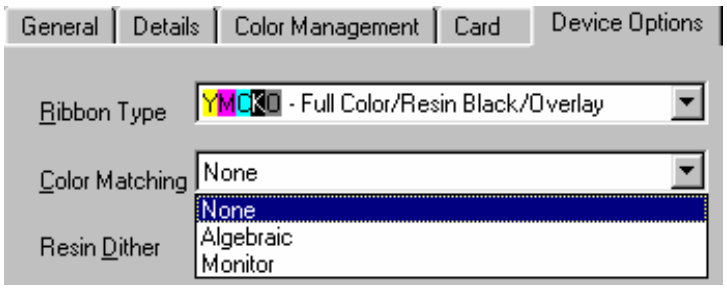
Use this option to control the amount of heat the Printer uses when printing with the resin black panel(s) of a full-color ribbon or when printing with a resin-only ribbon by adjusting the **Resin Heat** slide.

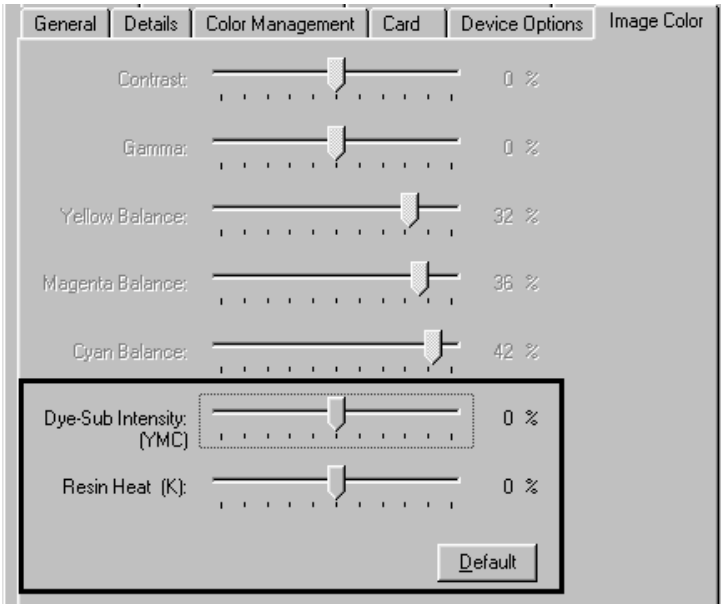
Step	Procedure
1	Move the slide to the left to cause less heat to be used in the printing process, causing resin images to be lighter or less saturated. **OR** Move the slide to the right to cause more heat to be used. (**Note:** This control can be helpful for fine-tuning the transfer of resin text and bar codes.)



Using the Color Matching option and Default button

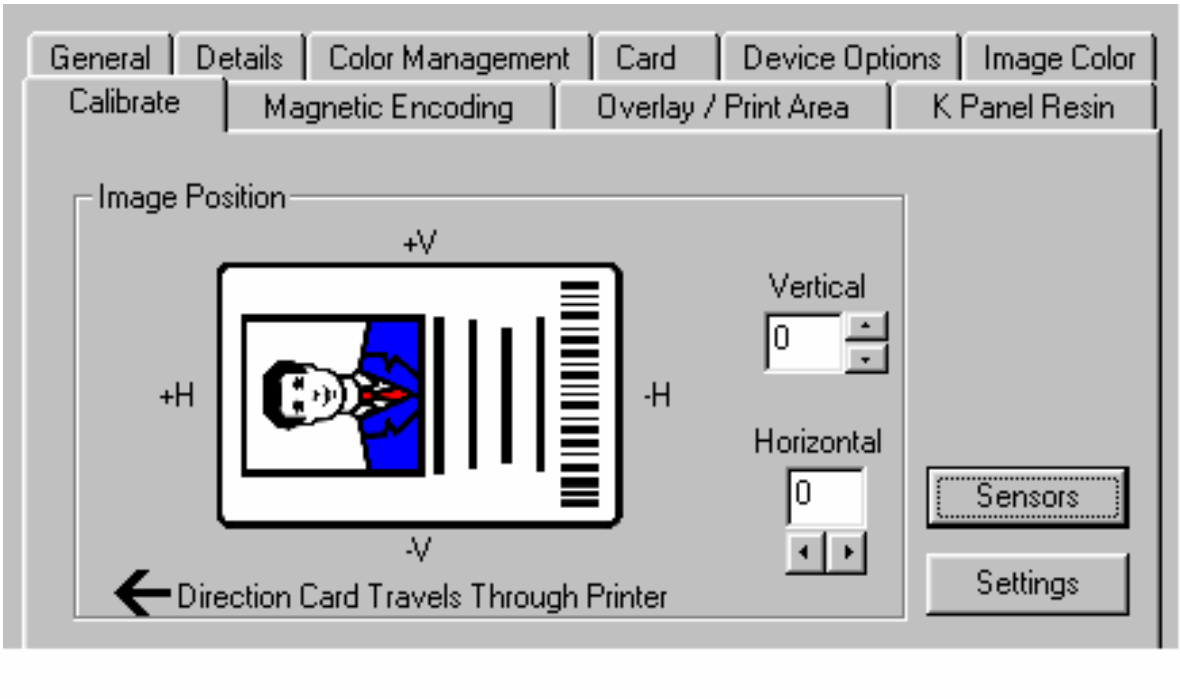
Step	Procedure
1	Select the **Algebraic color matching** option to display and adjust all control options. **OR** Select the **None or Monitor** option to display only the Dye-Sub Intensity and Resin Heat sliders.
2	To return all options to their factory settings, click on the **Default** button.





Using the Calibrate tab

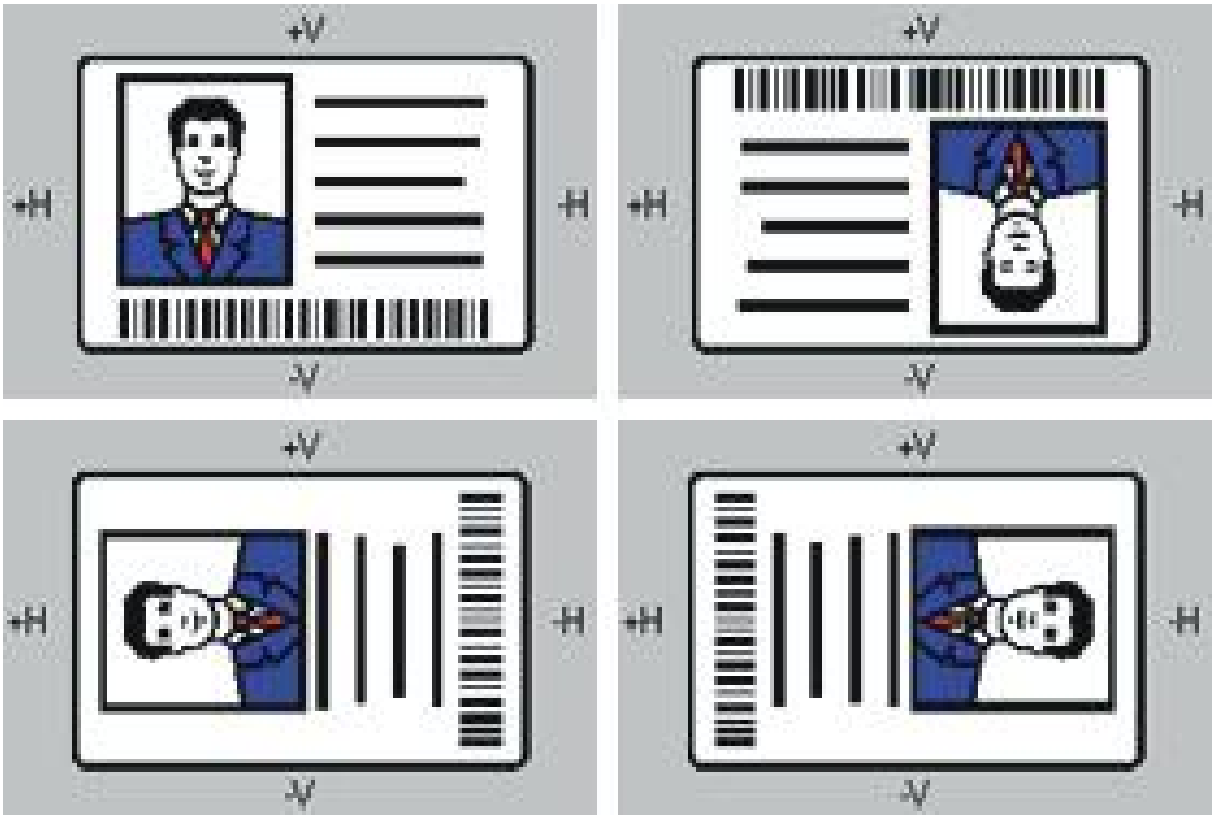
Use the Calibrate tab to (a) control the position of the printable area in relation to the card, (b) calibrate Sensors and (c) adjust the internal Printer settings that are customized for every Printer and saved directly within the Printer's memory.



Using the Image Position Controls

Use the **Image Position** controls to adjust the position of the overall print area to be precisely centered on a card.

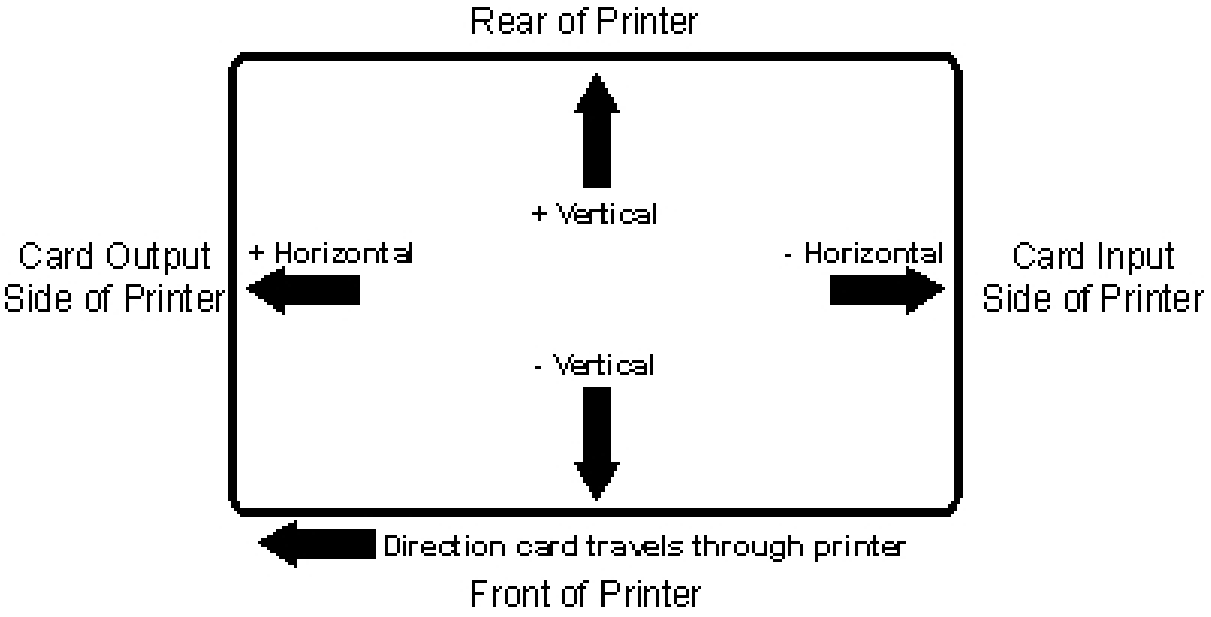
Step	Procedure
1	Click on the **Vertical** and **Horizontal** adjustment arrows to adjust the Image Position values. • When adjusting these values, keep in mind that cards always remain in the same position while moving through the Printer, regardless of image orientation. • To illustrate this, the card illustration shown in the Image Position box will flip and rotate according to the **Portrait**, **Landscape** or **Rotate 180 Degrees** selection. • The outline around the illustration will always remain in the same **Landscape** orientation.



Using Image Position controls (continued)

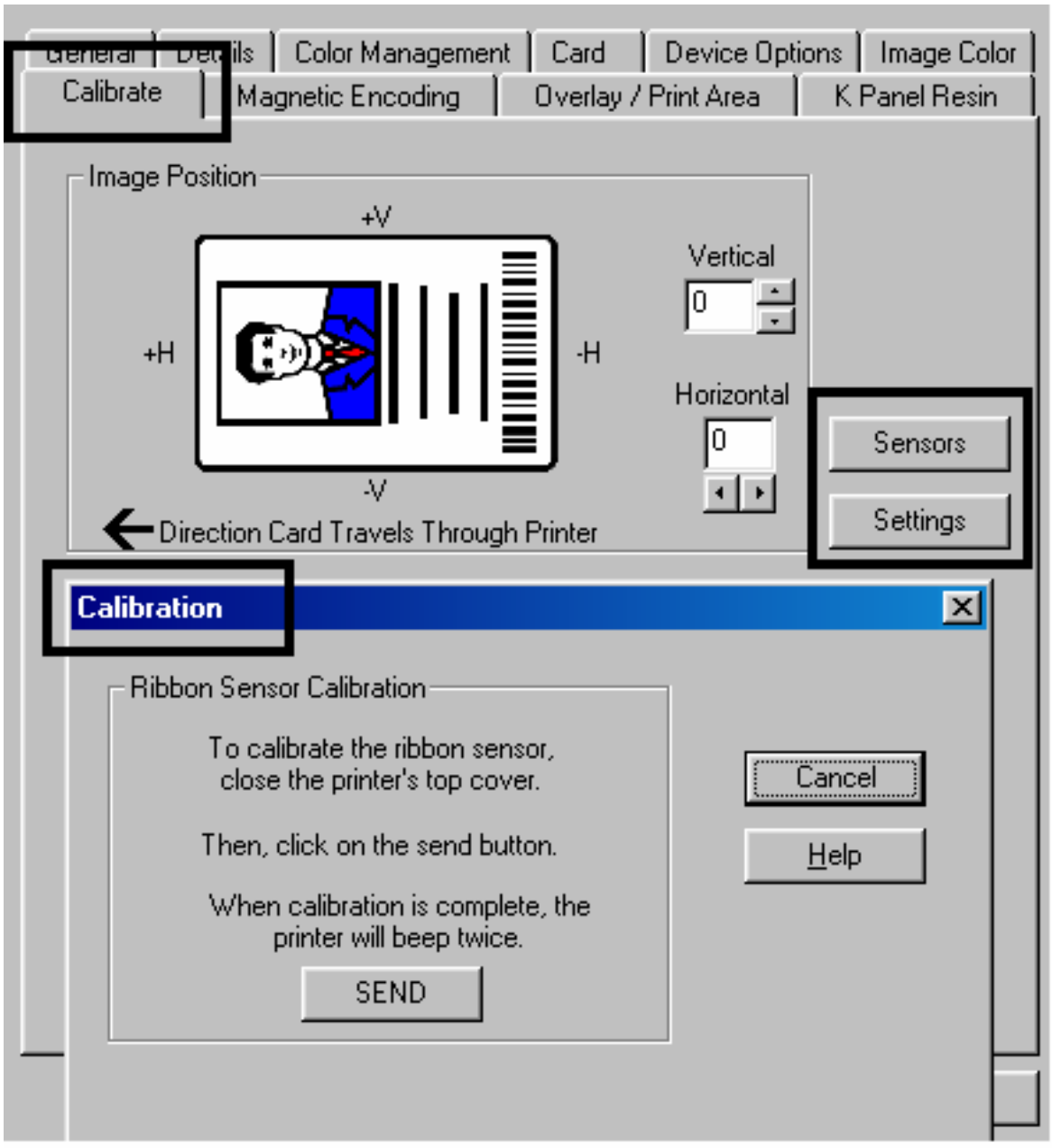
Review the Image Position diagram, which displays how the printed image will move in relation to the fixed card position as positive and negative image placement values are entered.

Step	Procedure
2	Use the **Vertical** adjustment to move the image: • Move toward the rear of the Printer if a positive number is entered. • Move toward the front of the Printer if a negative number is entered. **OR** Use the **Horizontal** adjustment to move the image: • Move toward the card output side of the Printer if a positive number is entered. • Move toward the card input side of the Printer if a negative number is entered. (**Note #1:** The maximum value for the **Vertical** and **Horizontal** adjustments is ±100 pixels (10 pixels = about .03"/. 8mm).) (**Note #2:** The **Vertical** and **Horizontal** adjustment arrows point to within the Image Position window, which represents the direction that the printed image moves.)



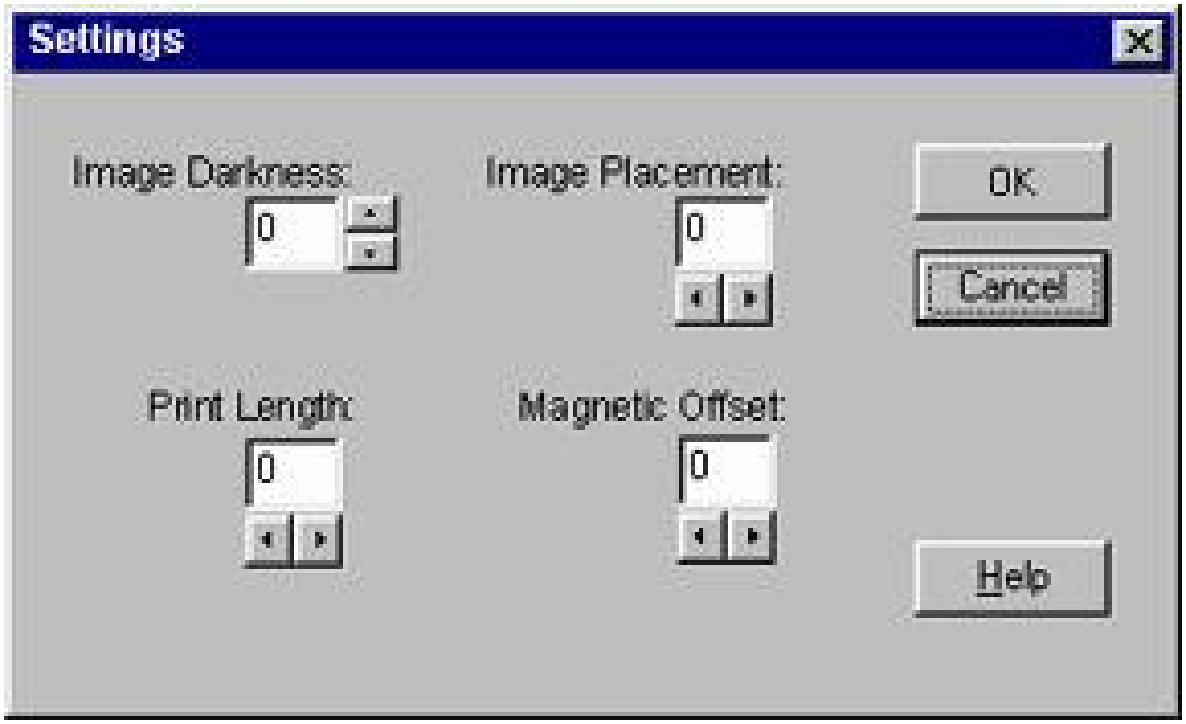
Using the Sensors button

Use the **Sensors** button to bring up a separate dialog box for calibrating the Printer's ribbon Sensor (see instructions in the Calibration window below).



Using the Settings button

Use the **Settings** button (see previous page) to bring up a separate dialog box for adjusting the internal Printer settings, which are customized for every Printer at the factory and saved directly within the Printer's memory. For more information see Using the Settings dialog box in section 3, page 79.

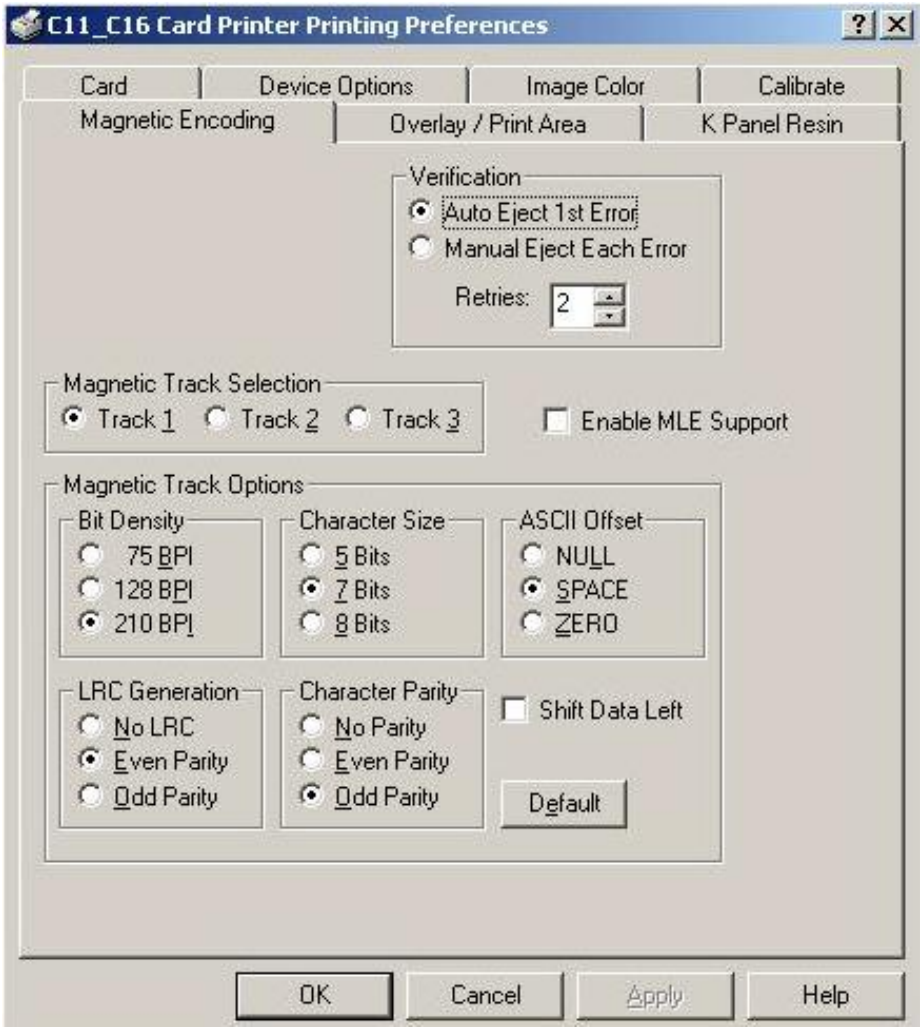


Using the Magnetic Encoding tab

Use this option only if the Printer has an optional Magnetic Stripe Encoding Module installed. The following describes these options and the Printer's magnetic encoding process.

- The Card Printer comes with either a high-coercivity factory-installed Magnetic Stripe Encoding Module or a low-coercivity module.
- The Printer cannot encode both types of Magnetic Stripes interchangeably within the same Printer.

Step	Procedure
1	Select the Magnetic Encoding tab to display options for controlling the Magnetic Stripe encoding process.

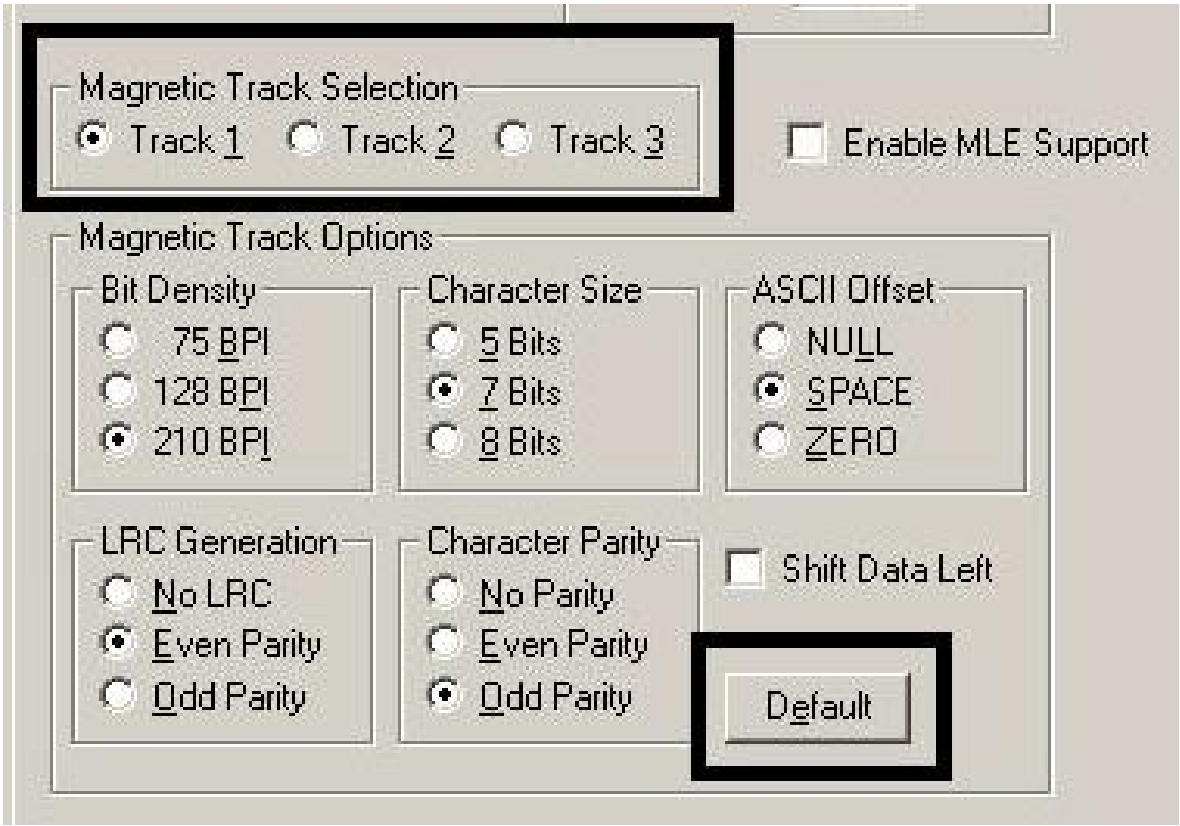


Using the Magnetic Track Selection radio buttons

Use the **Magnetic Track Selection** option to specify which track to configure through the Magnetic Track Options if the application requires customization of the standard ISO encoding process. (**Note:** Although the default ISO Magnetic Track Options should be correct for almost all applications, these options can be customized if the application requires it.)

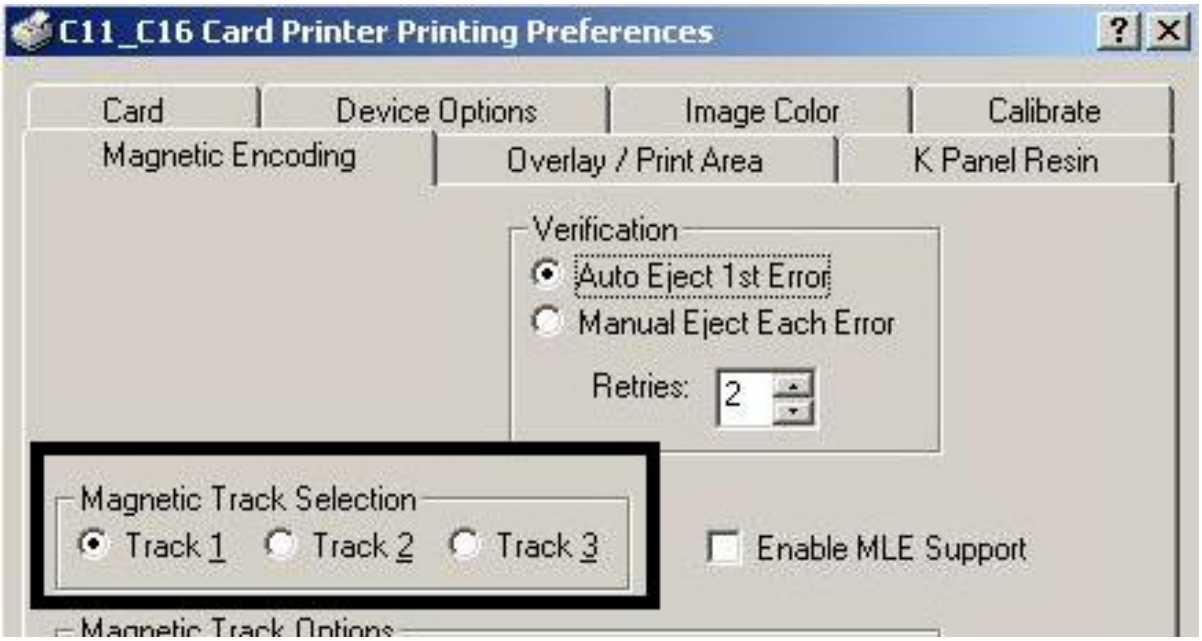
Step	Procedure
1	Select a Track selection to: a. Change all options separately for each of the three individual tracks. b. Select the **Default** button for each of the separate tracks to set these options back to the ISO Standard settings (once they have been changed). (**Important:** Please refer to the following for a description of all Magnetic Track Options.**)**

Continued on the next page



Using the Magnetic Track Selection radio buttons (continued)

Step	Procedure
2	Use the **Magnetic Track Selections** to configure the way in which each of the three magnetic tracks will encode. (**Note #1:** They do not designate which tracks the Printer will encode (e.g., to encode only Track 2). This must be done through the specific software program.) (**Note #2:** Although the Printer driver will remember the settings specified for each of the three tracks, the Printer driver will always default to displaying the options for Track 1 whenever the Printer driver setup screen is first opened.)



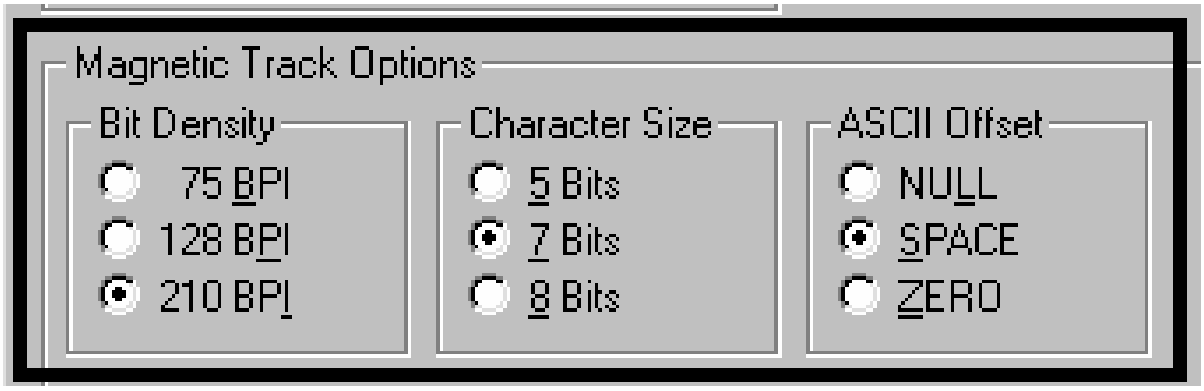
Using the Magnetic Track Options radio buttons

Use the **Magnetic Track** options for these purposes:

- Customize the ISO encoded data format for each of the Magnetic Stripe's three tracks.
- Customize each track independently of the other two.
- Specify which of the three tracks to customize by selecting one of the three track options.

(**Note #1:** After making the required selection, the Magnetic Track Options box displays the current set of customization options for the selected track.)

(**Note #2:** For most applications, the default settings for these options do not need to be changed.)



Using the Bit Density radio buttons

Use this option to customize the Bit Recording Density (Bits per Inch) used to encode the magnetic data on the currently selected track.

Step	Procedure
1	Select 75 BPI to change the bits per inch to 75 BPI. **OR** Select 128 BPI to change the bits per inch to 128 BPI. **OR** Select 210 BPI to change the bits per inch to 210 BPI.

Using the Character Size radio buttons

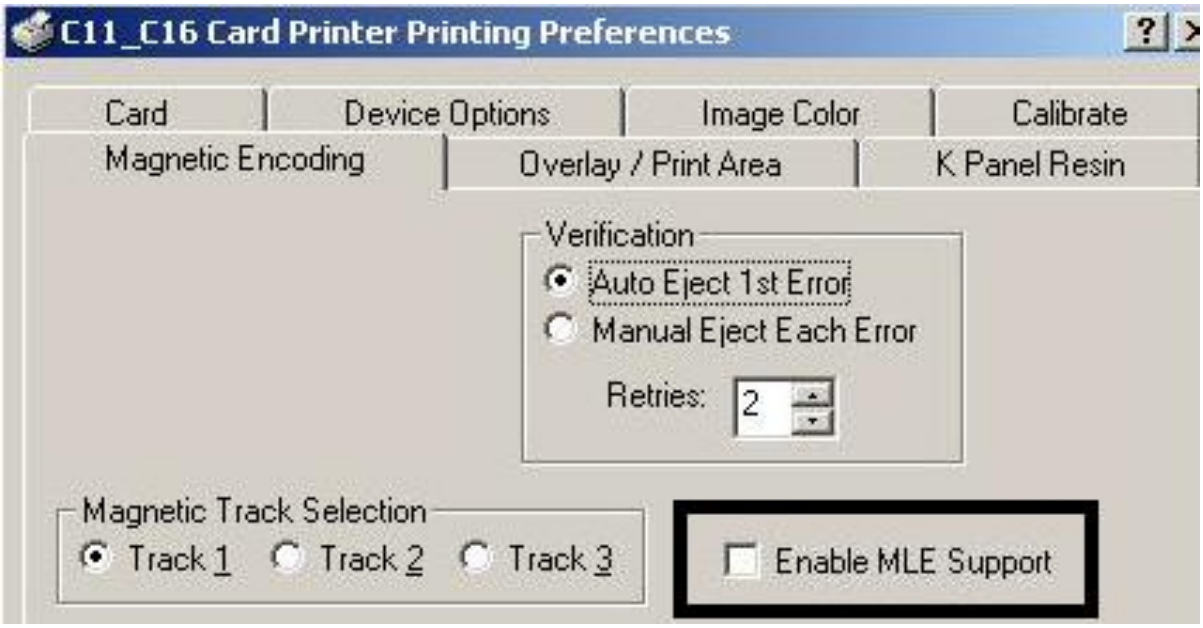
Use this option to customize the Character Data Size (Bits per Character) used to encode the magnetic data on the currently selected track. (**Note:** This character size includes the parity bit (if enabled).)

Step	Procedure
1	Select 5 Bits to change the bits per character to 5 BPC. **OR** Select 7 Bits to change the bits per character to 7 BPC. **OR** Select 8 Bits to change the bits per character to 8 BPC.

Reviewing the Enable MLE Support checkbox

Multi-Language Extension (MLE) support in Windows XP can cause text strings to be broken up into fragments. This fragmentation of the text string prevents magnetic encoding.

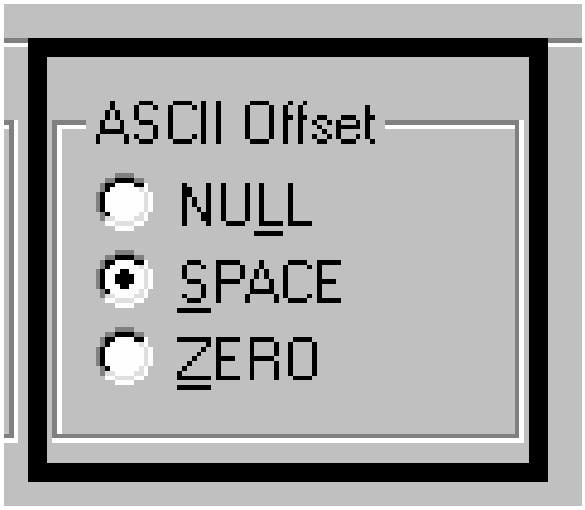
Step	Procedure
1	Check this box to allow the Driver to process the fragmented text.



Using the ASCII Offset radio buttons

Use this option to customize the Character ASCII Offset used to encode the magnetic data on the currently selected track. (**Note:** This character offset value is subtracted from the ASCII value of each Magnetic Stripe data character prior to encoding on the track.)

Step	Procedure
1	Select NULL to change the ASCII Offset to NULL. **OR** Select SPACE to change the ASCII Offset to SPACE. **OR** Select ZERO to change the ASCII Offset to ZERO.



Using the LRC Generation radio buttons

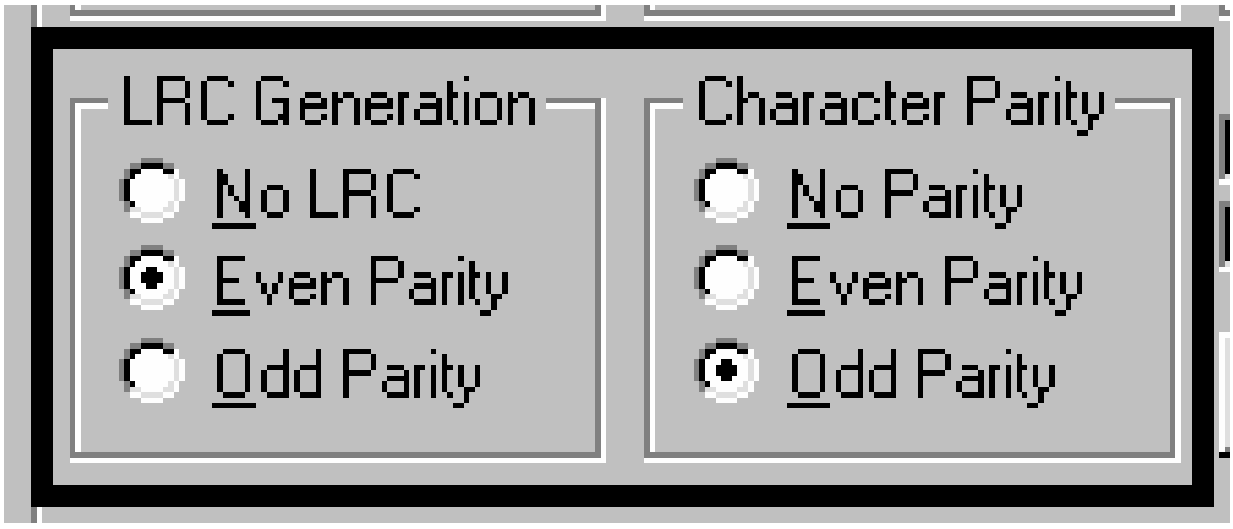
Use this option to customize the LRC Generation Mode (used to encode the magnetic data on the currently selected track).

Step	Procedure
1	Select NO LRC to change the LRC Generation to none. **OR** Select Even Parity to change the LRC Generation to Even Parity. **OR** Select Odd Parity to change the LRC Generation to Odd Parity.

Using the Character Parity radio buttons

Use this option to customize the Character Data Parity (used to encode the magnetic data on the currently selected track).

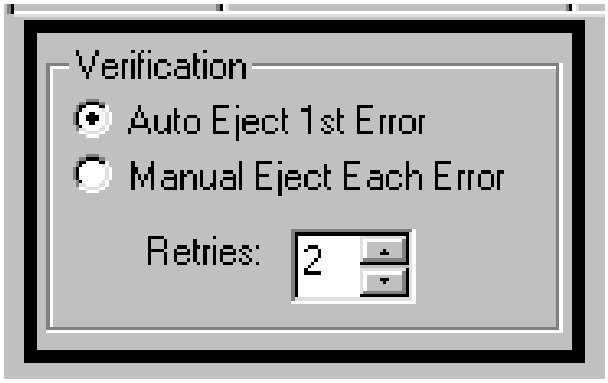
Step	Procedure
1	Select No Parity to change the Character Parity to none. **OR** Select Even Parity to change the Character Parity to Even Parity. **OR** Select Odd Parity to change the Character Parity to Odd Parity



Using the Verification radio buttons and Retries selection

Use this option to customize the encoding verification settings.

Step	Procedure
1	Select the **Auto Eject 1st Error** option to instruct the Printer to verify that all magnetic data has been correctly encoded on each card. (**Note:** The **Auto Eject** option is the most direct means of dealing with misverified cards; however, it may be undesirable when dealing with encoding errors. For this reason, a **Manual Eject Each Error** option is also provided.) • If the **Auto Eject 1st Error** option is selected, the Printer will automatically eject a card containing magnetic data that cannot be verified and will feed a new card into the Printer. (**Note:** Only the first misverified card would be automatically ejected.) • If a second consecutive card cannot be verified, the Printer will signal an error and go into a **Manual Eject Mode**. (**Note:** If the loaded cards have the wrong type of Magnetic Stripe, the Printer will not automatically feed and eject the entire card supply.) **OR** Select the **Manual Eject Each Error** option so that the Printer will signal an error communicating the magnetic data could not be verified. • **Unverified Magnetic Data:** When this occurs, press the **Pause/Resume** button to manually eject the misverified card and feed in a new card. • **Retries selection:** Specify the number of times the Printer must retry its verification pass. (**Note:** A range of 1 to 5 retries can be selected. This option is helpful since successful Magnetic Stripe verification can sometimes require more than a single pass.)



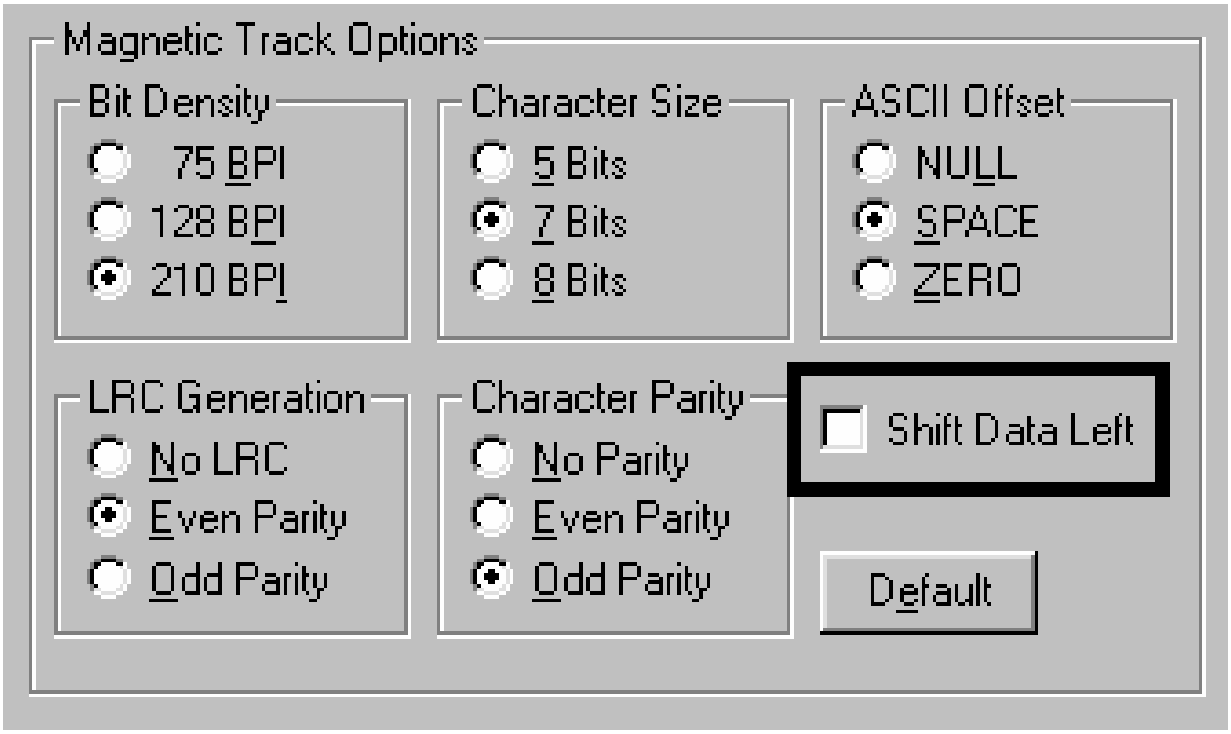
Using the Shift Data Left checkbox

Use this option to shift the recorded magnetic data to the left-hand side of the card's Magnetic Stripe.

OR

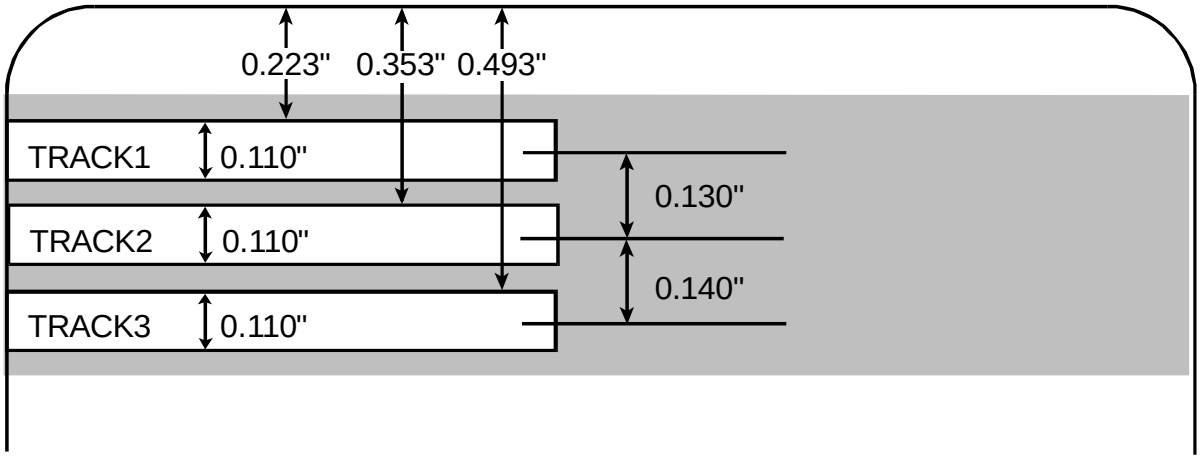
Use this option for situations that require cards to be readable with insert type readers that may be unable to read the right-hand side of the card.

Step	Procedure
1	Select the **Shift Data Left** checkbox option to apply to all tracks.



Reviewing the ISO Track Locations

Review the magnetic encoding module, which encodes onto tracks in accordance with an ISO 7811-2 Magnetic Stripe. (**Note:** Refer to the diagram (below) for track locations.)



Sending the Track Information

Magnetic track data is sent in the form of text strings from the application software to the Printer driver along with all of the other printable objects within the card design.

- **Magnetic Track Data added:** In order for the Printer driver to differentiate between magnetic track data and the rest of the printable objects, the magnetic track data strings must be uniquely tagged or added.
- **Specific Characters added:** In other words, specific characters must be added to the magnetic track data in order for the Printer driver to know which data is to be encoded, which tracks to encode, when the track data stops and starts and so forth.
- **Manually or automatically added:** In some cases, these specific characters are automatically added to the string of track data by customized ID software applications. In most cases, however, the User must manually add these characters to the string of magnetic track data.

Entering the Track Information

(**Note:** If these characters are not added to the track data, the text intended for the magnetic track will most likely appear as printed text on the card.)

Step	Procedure
1	To avoid this symptom, track information must be entered as follows. When entering track data, the "~" character is entered first, followed by the desired track number (1, 2 or 3) used to encode the data. • The data to be encoded should then follow. (**Note:** The first character of this data string must be the track's specific Start Sentinel (SS) and the last character must be the specific End Sentinel (ES).) • The characters or data in between the SS and ES can include all of the valid characters specific to each track. (**Note:** The number of these characters is limited by each track's maximum character capacity.) **Caution:** When segmenting track data, strictly use the appropriate Field Separator (FS).

Reviewing Tracks 1, 2 and 3 (in table format)

Review this table, which displays the SS, ES, FS and the valid characters defined for each track.

	Start Sentinel	End Sentinel	Field Separator	Valid Characters	Maximum Number of Characters
Track 1	%	?	^	ASCII 32-95 (See the table below.)	78
Track 2	;	?	=	ASCII 48-63 (See the table below.)	39
Track 3	;	?	=	ASCII 48-63 (See the table below.)	106

Reviewing the Track Data Note

Review this Note, which displays how track the data should be entered for Tracks 1, 2 and 3:

Track	Data Entry
Sending data to Track 1	**~1%JULIE ANDERSON^623-85-1253?**
Sending data to Track 2	**~2;0123456789?**
Sending data to Track 3	**~3;0123456789?**

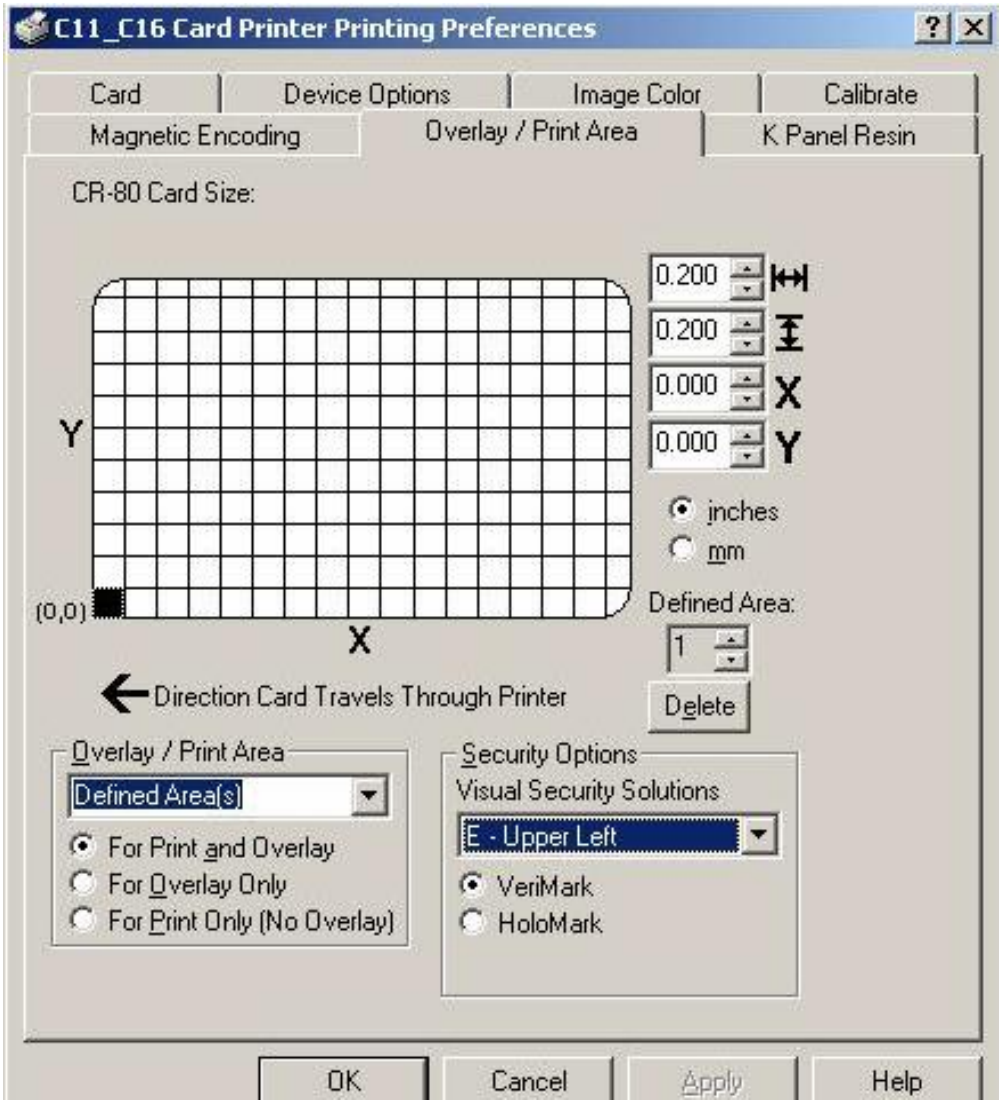
Reviewing the ASCII Code and Character Table

ASCII Code	Character	ASCII Code	Character	ASCII Code	Character
32	space	56	8	80	P
33	!	57	9	81	Q
34	"	58	:	82	R
35	#	59	;	83	S
36	$	60	<	84	T
37	%	61	=	85	U
38	&	62	>	86	V
39	'	63	?	87	W
40	(	64	@	88	X
41	)	65	A	89	Y
42	*	66	B	90	Z
43	+	67	C	91	[
44	'	68	D	92	\
45	-	69	E	93	]
46	.	70	F	94	^
47	/	71	G	95	_
48	0	72	H		
49	1	73	I		
50	2	74	J		
51	3	75	K		
52	4	76	L		
53	5	77	M		
54	6	78	N		
55	7	79	O		

Using the Overlay/Print Area tab

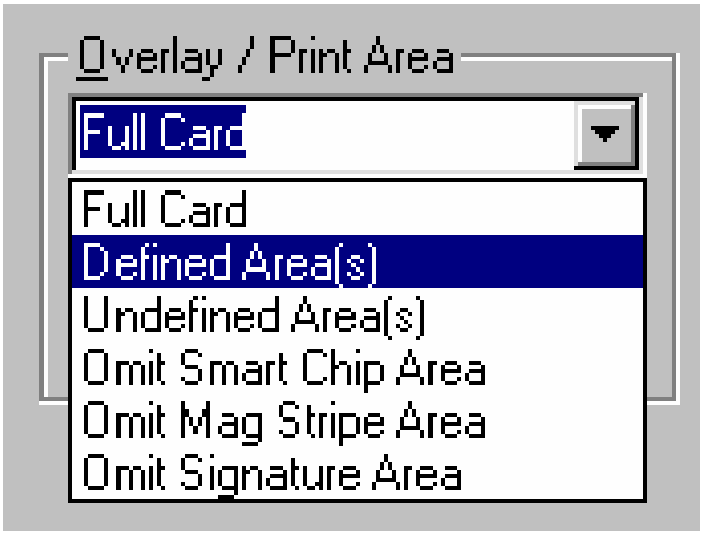
Use this option to control where the Overlay (O) Panel and/or the print area appears on a card. (**Note:** This option is helpful if, for example, you would like to omit or block out the overlay or printing around a card's smart chip or Magnetic Stripe.)

- Note that with M11, this option only applies to the print area since monochrome ribbons do not have an Overlay (O) Panel.
- By default, this option is set to print and overlay the entire card. To customize the overlay and/or print area, select one of the options listed under "Overlay/Print Area."



Using the Overlay/Print Area dropdown menu

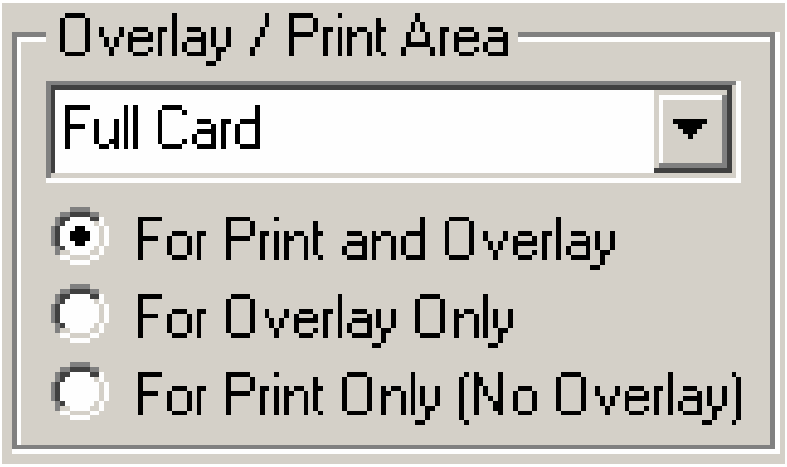
Step	Procedure
1	Select the **Full Card** option for the Printer to overlay and/or print the entire card. **OR** Select the **Defined Area(s)** option for the Printer to overlay and/or print only in the selected and defined area or areas. **OR** Select the **Undefined Area(s)** option for the Printer to overlay and/or print only in the space outside the selected and defined area. **OR** Select the **Omit Smart Chip Area** option for the Printer to overlay and/or print only in the space outside the standard location of a smart chip. **OR** Select the **Omit Mag Stripe Area** option for the Printer to overlay and/or print only in the space outside the standard location of an ISO Magnetic Stripe. **OR** Select the **Omit Signature Area** option for the Printer to overlay and/or print only in the space outside the standard location of a signature panel. (**Note:** In the card grid, black indicates the area in which the overlay and/or printing will be applied.)



Using the Overlay/Print Area

Use these **Overlay/Print Area** options to control both the print and overlay together or control each individually.

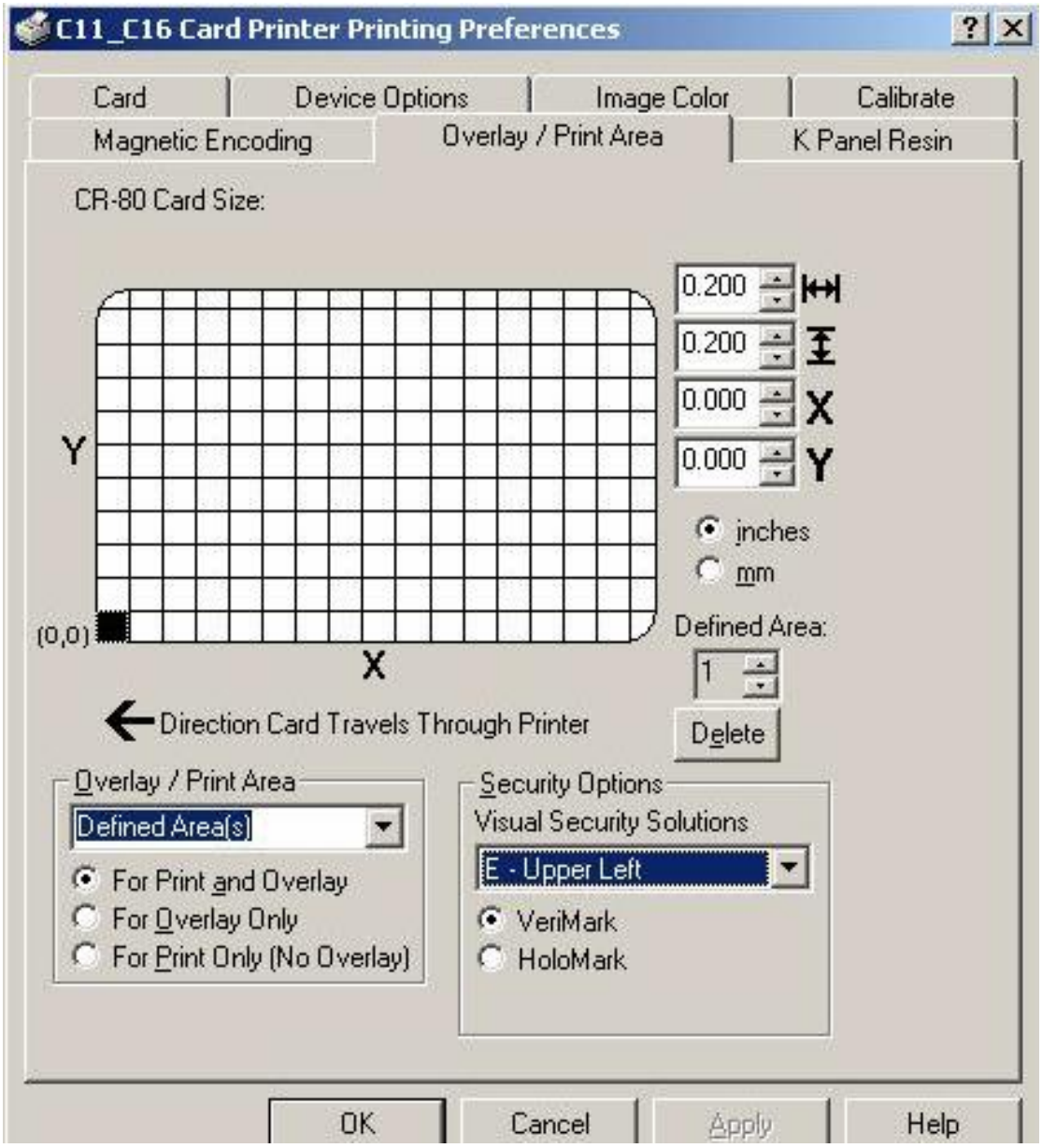
Step	Procedure
1	Select **For Print and Overlay** for the defined area to apply to both the printing and overlay process. **OR** Select **For Overlay Only** for the defined area to apply only to the overlay process. (**Note:** In this mode, printing will still be allowed over the entire card and only the overlay will be affected.) **OR** Select **For Print Only (No Overlay)** for the defined area to apply only to the print process. (**Important:** In this mode, the overlay is completely disabled so it will not be applied.) **Caution:** An overlay or an overlaminate must protect dye-sublimation printing or it will quickly begin to wear or fade.



Using the Defined Area Option

Step	Procedure
1	Select the **Defined Area(s)** option to activate the card grid in the upper half of the window. It is through this card grid that up to five (5) Defined Areas can be assigned.

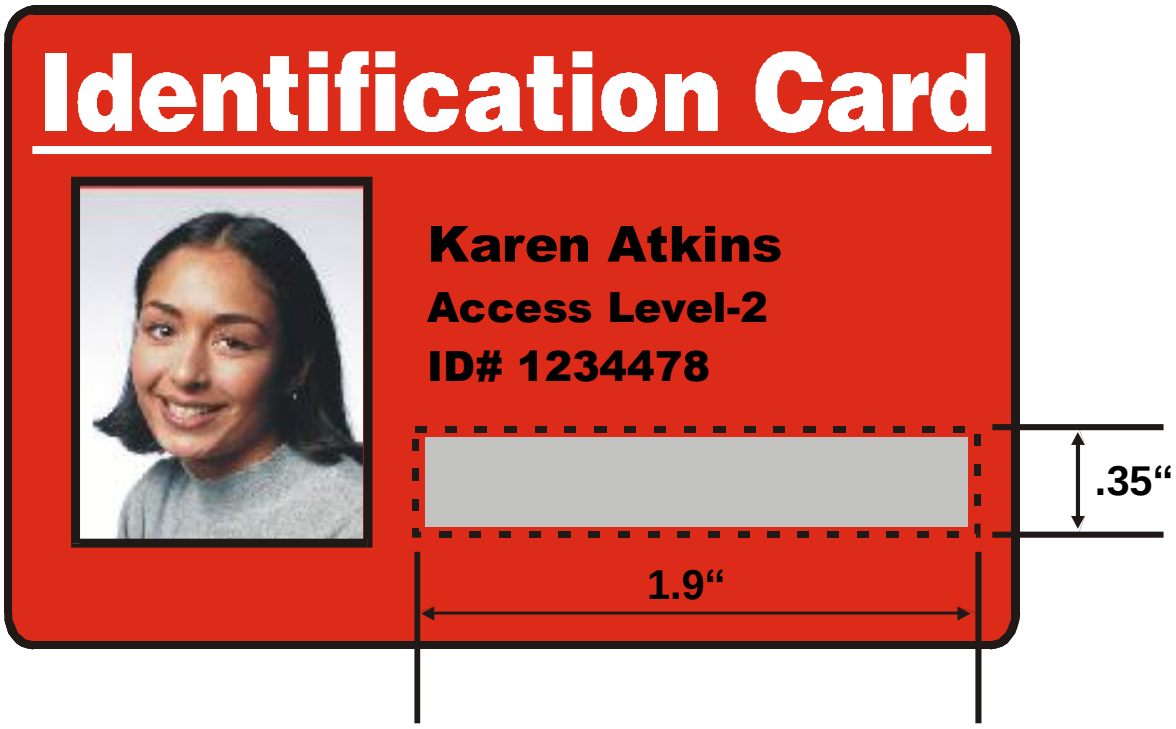
Continued on the next page



Using the Defined Area Option (continued)

Step	Procedure
2	When the card grid is first activated, a small black square will appear at its default size of .2" x .2"/5mm x 5mm and at its default location in the lower left-hand corner (0,0). This square represents the first defined area. • Determine the area of the card needed to define for a signature panel with a different size and location than the driver's standard **Omit Signature Area** setting. (**Note:** This area is indicated by the dashed outline.) • Determine the area size by actually printing a card and looking at it in the same orientation as when it exits the Printer.
3	Measure the total size of the desired area and enter those dimensions into the dimension boxes. (**Note:** The minimum size an area is .2" x .2"/5mm x 5mm.)

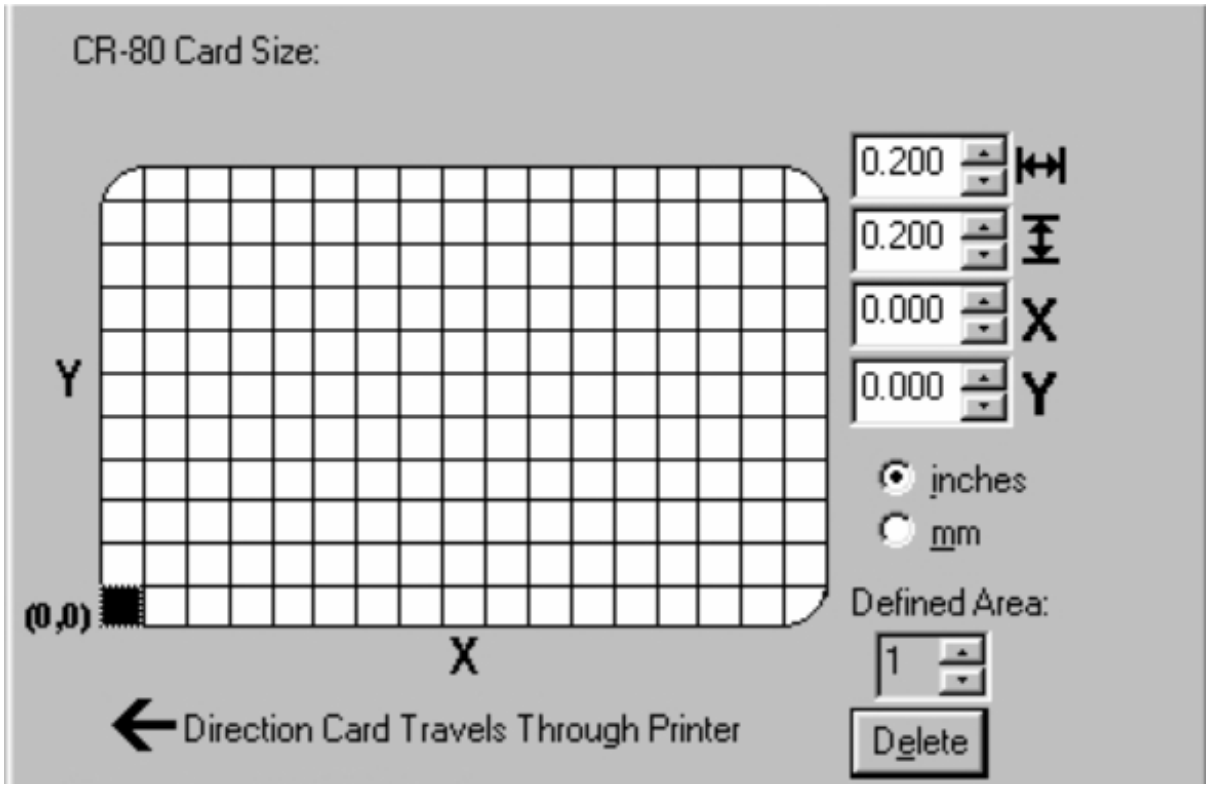
Continued on the next page



Using the Defined Area Option (continued)

Step	Procedure
4	Measure from the lower left corner of the card up and over to the lower left corner of for the defined area to begin and enter these values into the X and Y boxes. (**Note:** The card grid lines are spaced at .2 inch/5mm intervals.)

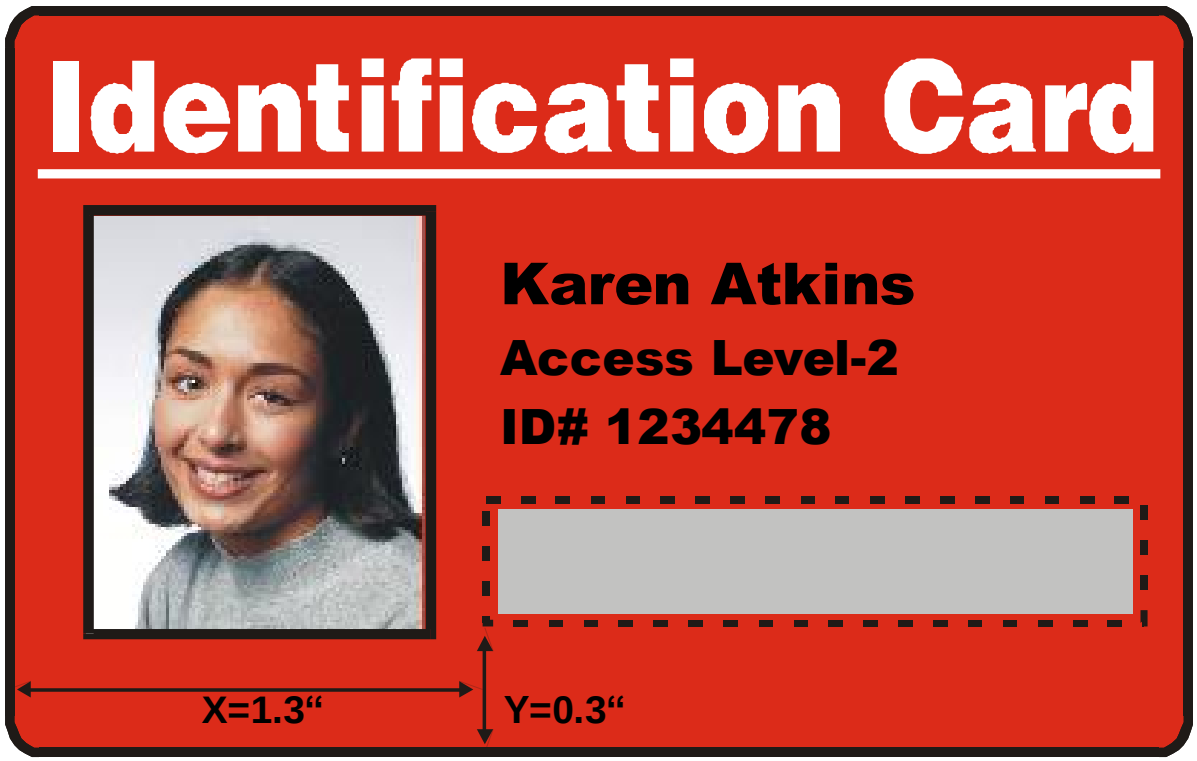
Continued on the next page



Using the Defined Area Option (continued)

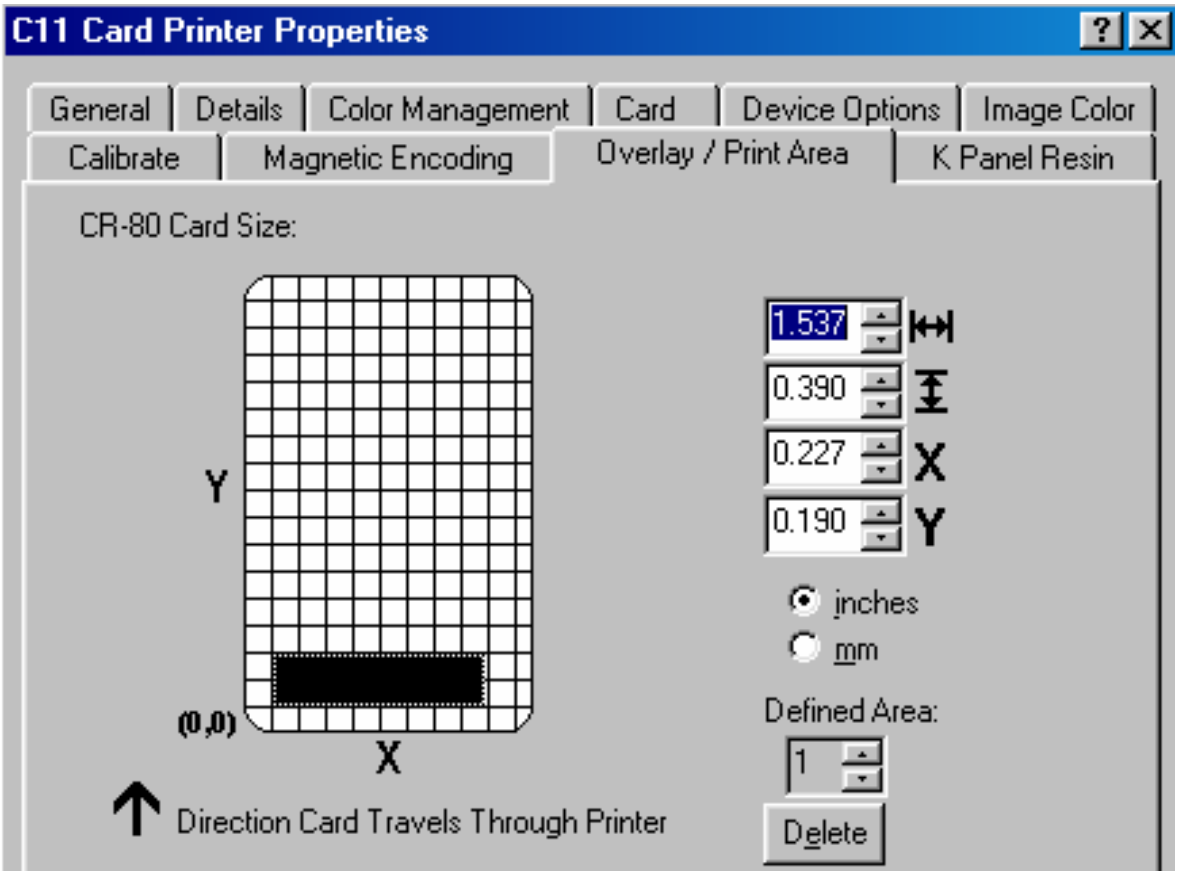
Step	Procedure
5	a. Print the card design and observe how the image is oriented on the card as it ejects from the Printer. (**Note:** The location of a defined area is based on the card orientation as it exits the Printer.) b. Measure the defined area location based on the printed card. (**Note:** If selecting the **Rotate Front 180 Degrees** option, the image will appear upside down as it exits the Printer.) c. Position the defined area opposite to the measurement of the onscreen card design (which will appear rightside up).

Continued on the next page



Using the Defined Area Option (continued)

Step	Procedure
6	Use the Defined Area arrows to navigate back and forth from area to area. (**Note:** The active area will always be highlighted with a dotted outline.) a. Define another area by clicking on the Defined Area UP arrow. • Another .2" x .2"/5mm x 5mm area will appear in the lower left-hand corner. (**Note:** This is the location in which all newly defined areas will first appear.) • Up to 5 areas can be defined; however, additional areas cannot be added until the most recently created area has been moved or sized. (**Note:** For this reason, size and position each area as it is created.) b. Delete an area by using the Defined Area arrows to select the area and click on the **Delete** button. (**Note:** If all areas are deleted, the **K Panel Resin** options will automatically be deselected.)

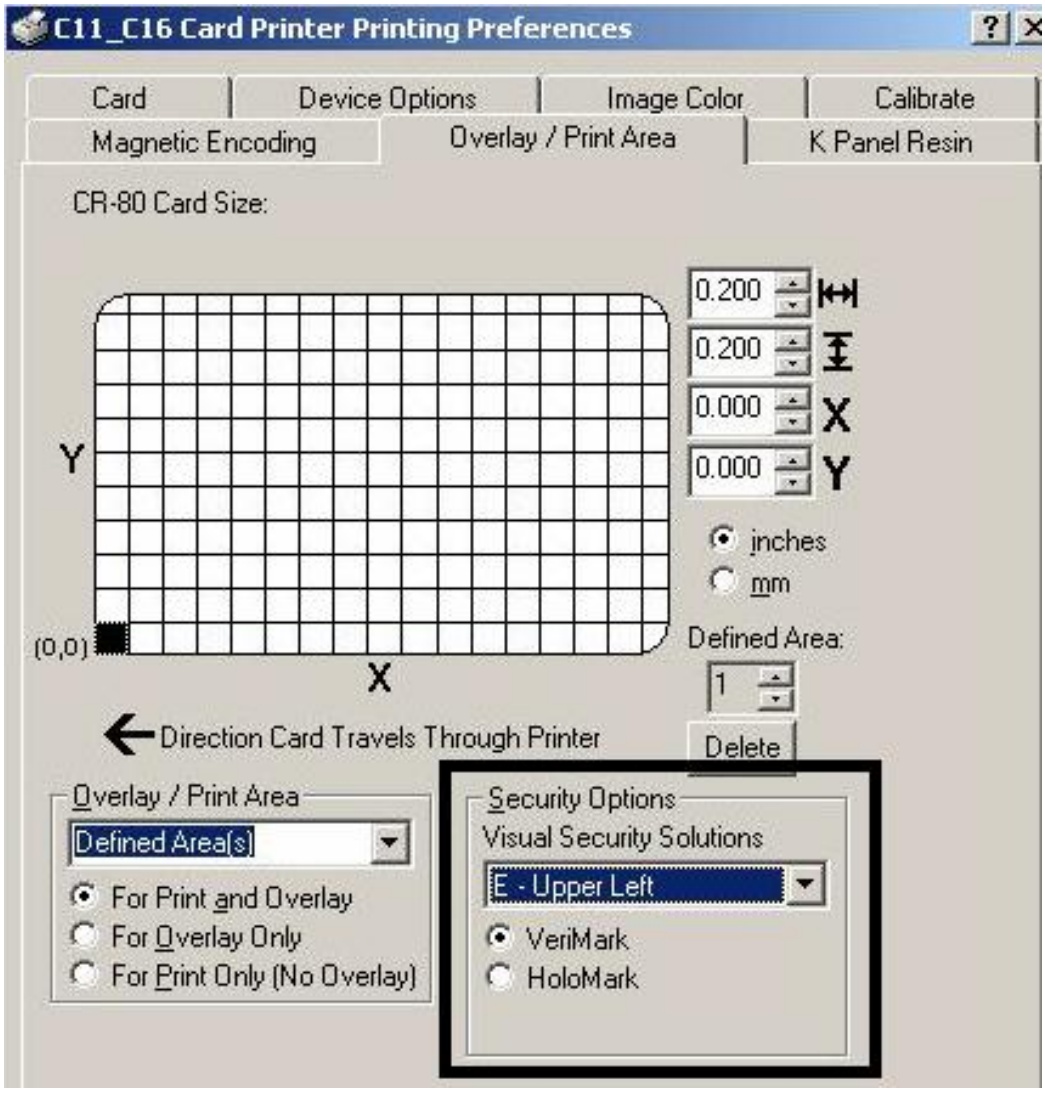


Using Security Options (Visual Security Solutions)

The Visual Security Solutions dropdown menu list will be used to enable and select which type of visual security will be used. The Visual Security dropdown list will be selectable only on the Front side (see below). Visual Security is not an option for the back side.

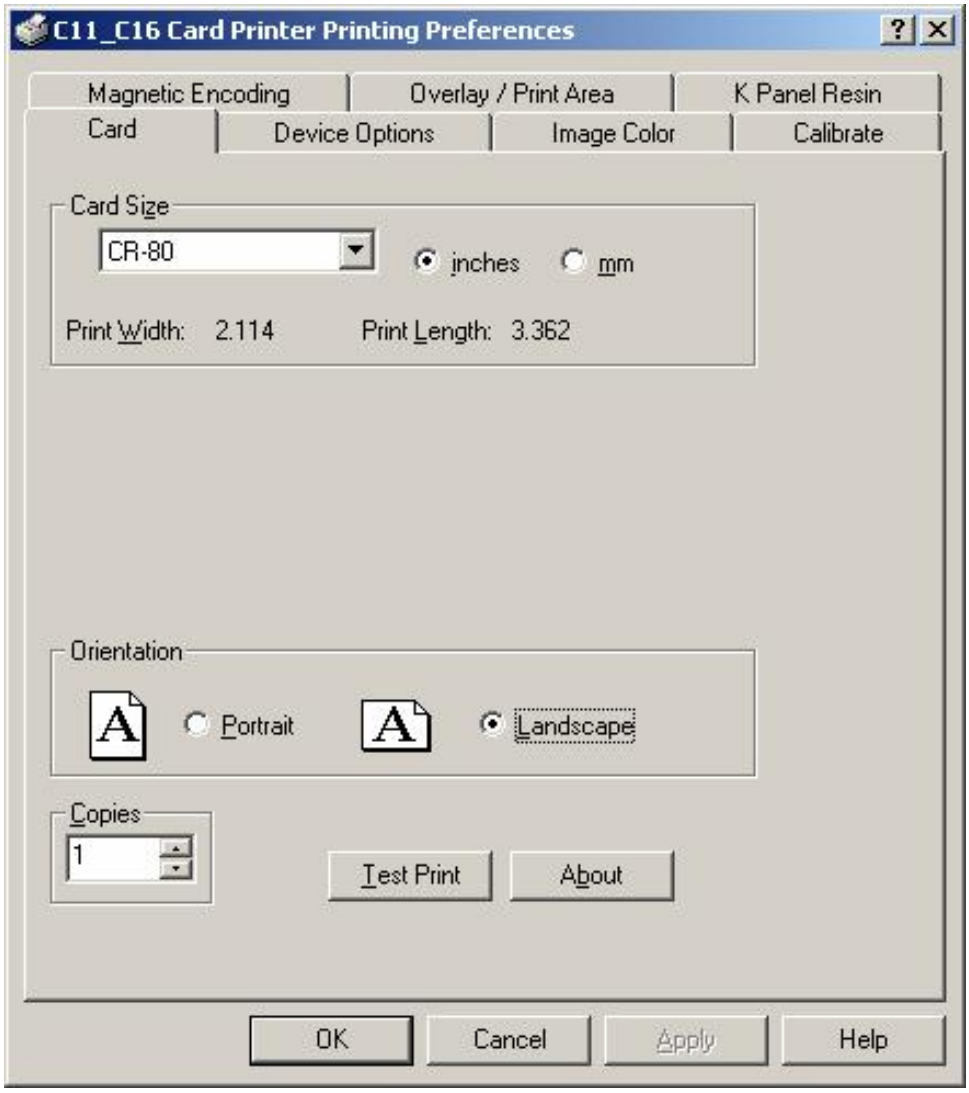
The following actions will occur when one of the Visual Security locations is selected.

- The Overlay/Print Area will be disabled.
- SmartShield will be disabled.
- The Foil Options become selectable.



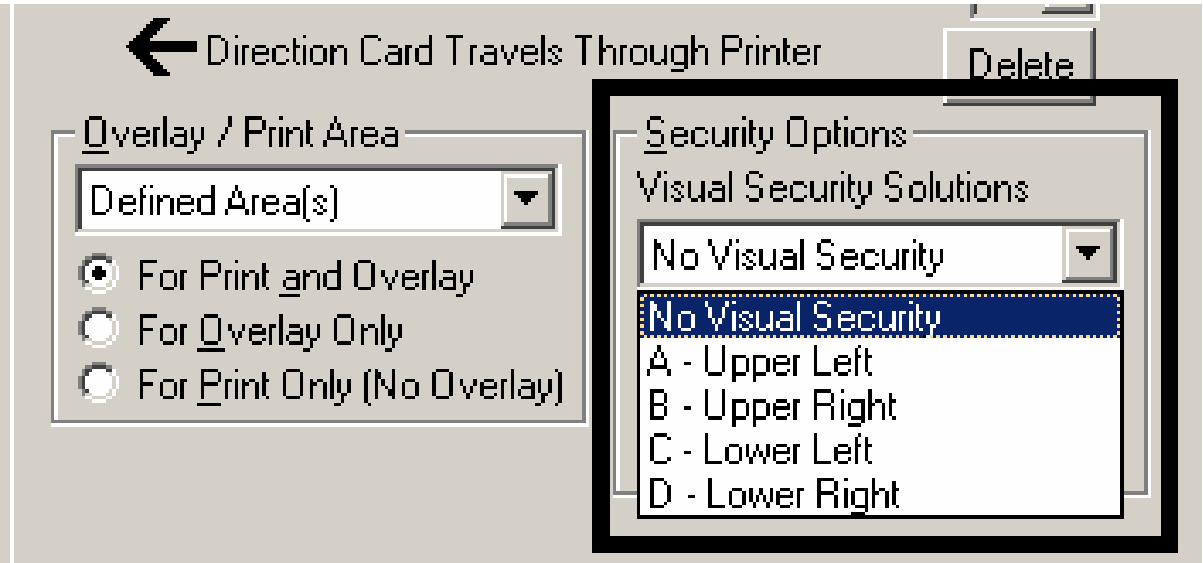
Selecting Orientation - Landscape under Card tab

Step	Procedure
1	Select the Landscape radio button (below) under Orientation under the Card Size tab to use the Visual Security Solutions (A to D), as shown in this window.



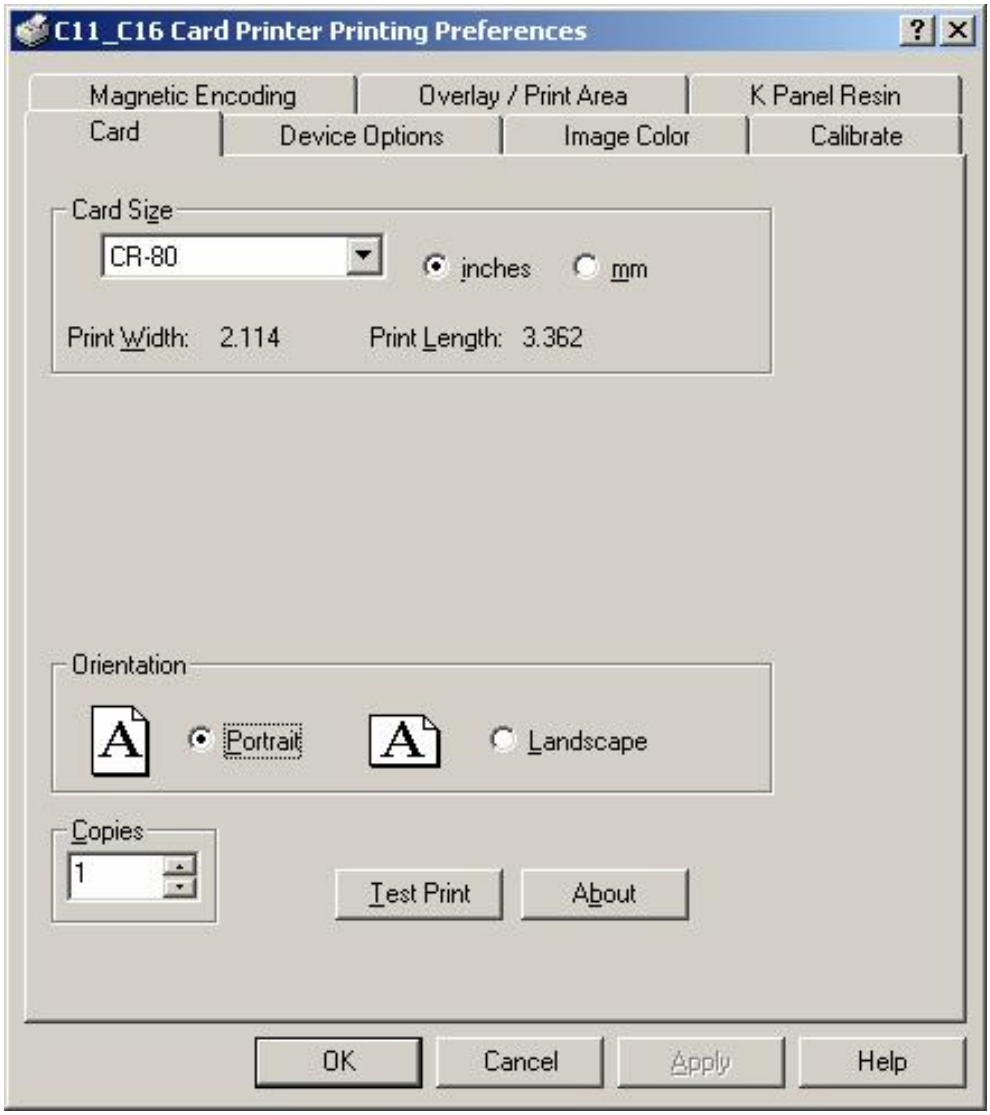
Selecting the Visual Security Solutions dropdown menu (A to D)

Step	Procedure
1	Click on the Visual Security Solutions dropdown menu (below) under the Landscape - Orientation (see above) to use the options shown in this display.



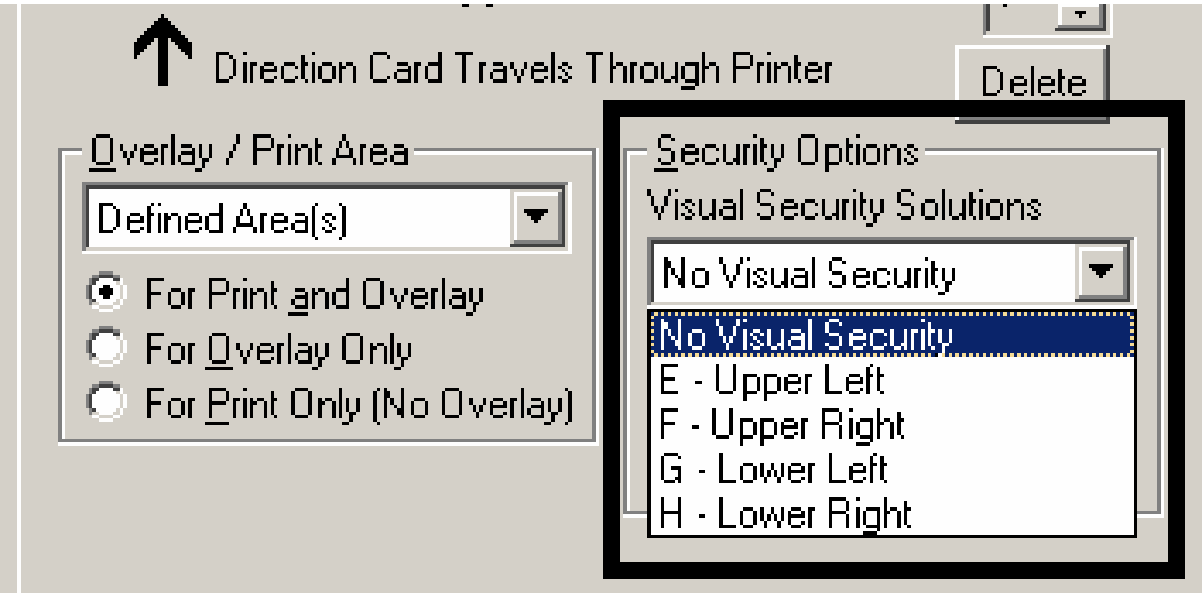
Selecting Orientation - Portfolio under Card tab

Step	Procedure
1	Select the Portrait radio button (below) under Orientation under the Card Size tab to use the Visual Security Solutions (E to H), as shown in this window.



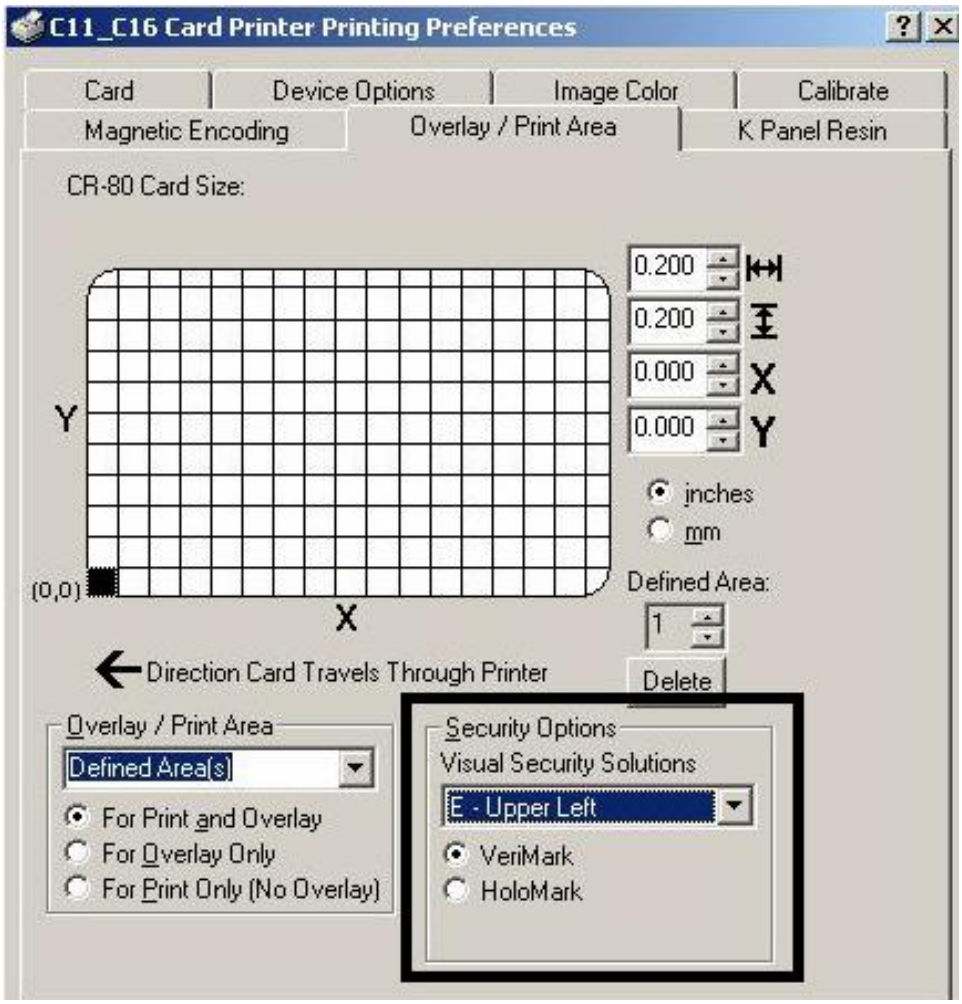
Selecting the Visual Security Solutions dropdown menu (E to H)

Step	Procedure
1	Click on the Visual Security Solutions dropdown menu under the Portrait - Orientation (see above) to use the options shown below.



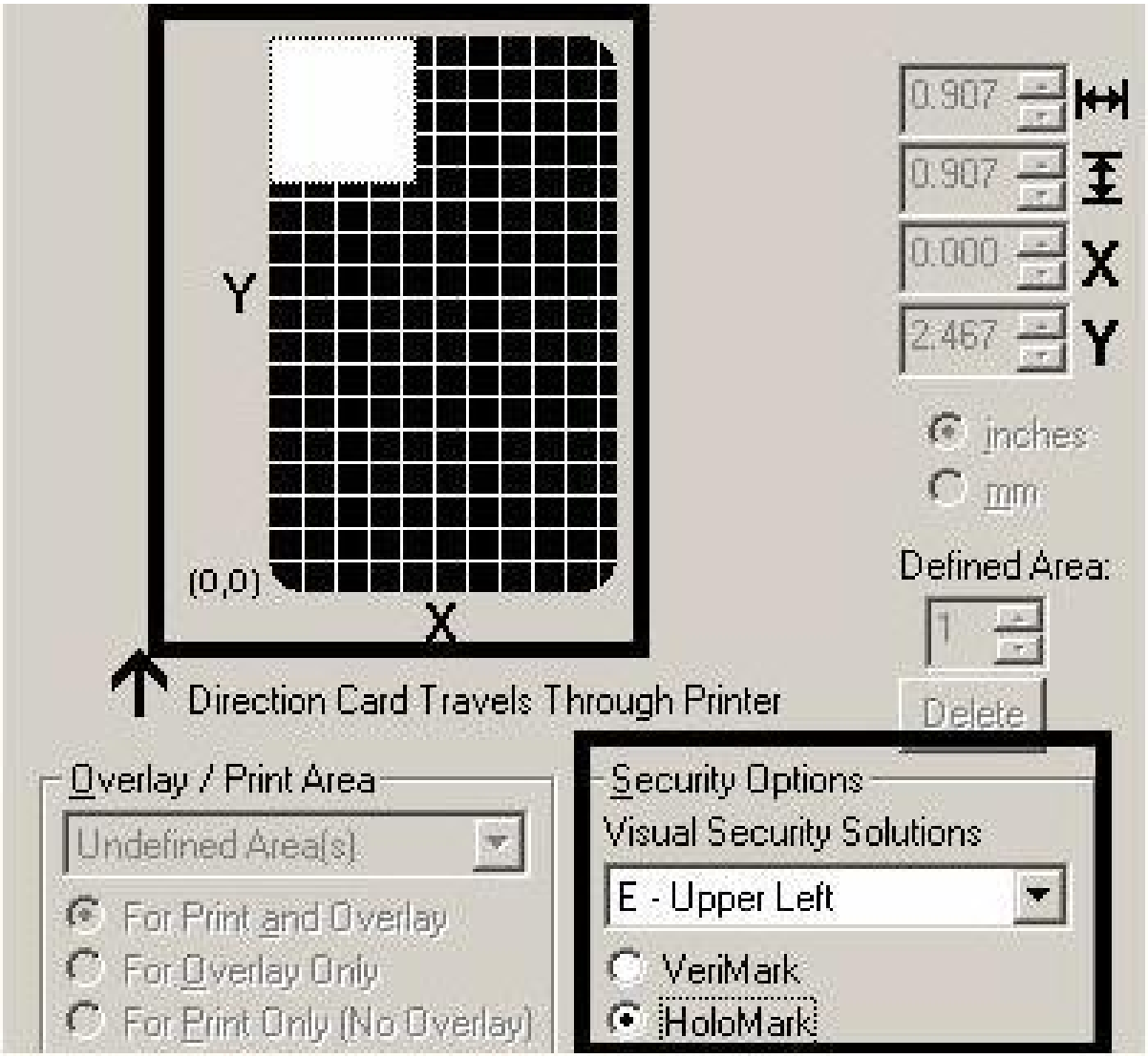
Selecting the VeriMark radio button

Step	Procedure
1	Click on either the **VeriMark** or **HoloMark** radio button, as shown below. The foil options are used to control the size of the exclusion area. (**Note:** When VeriMark is selected a rectangle-sized area is excluded, HoloMark uses a square sized area.)
2	Click on the **VeriMark** radio button (below) for the rectangle-sized area.



Selecting the HoloMark radio button

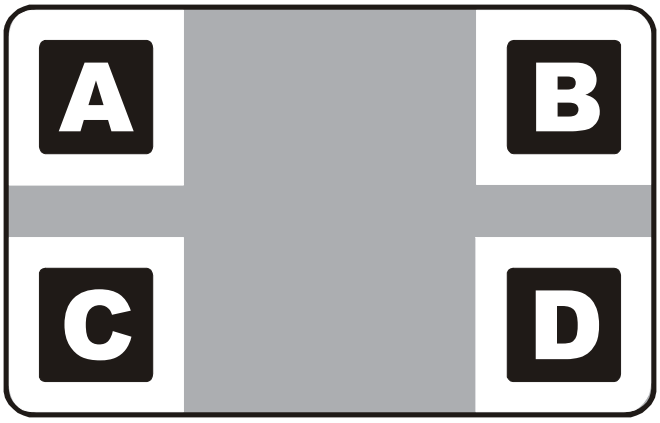
Step	Procedure
1	Click on the **HoloMark** radio button (below) for the squared-area size.



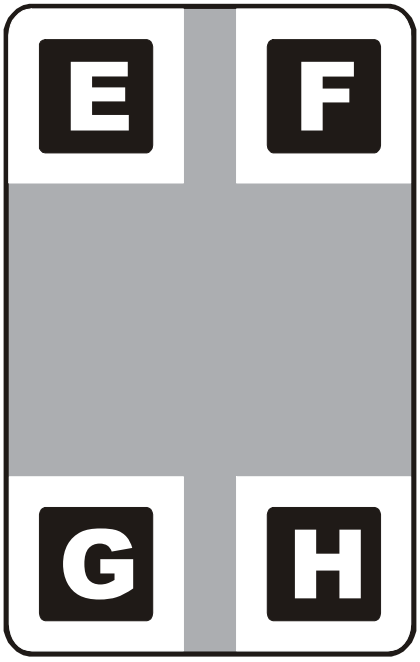
Reviewing the Custom VeriMark Card (Custom Graphic in a 2D foil)

The custom VeriMark image is stamped on blank, standard-sized cards. You can select one of eight positions (A to H), as shown in the Portrait and Landscape samples below.

Sample 1: VeriMark Card (Landscape - Orientation) - 4 positions (below)



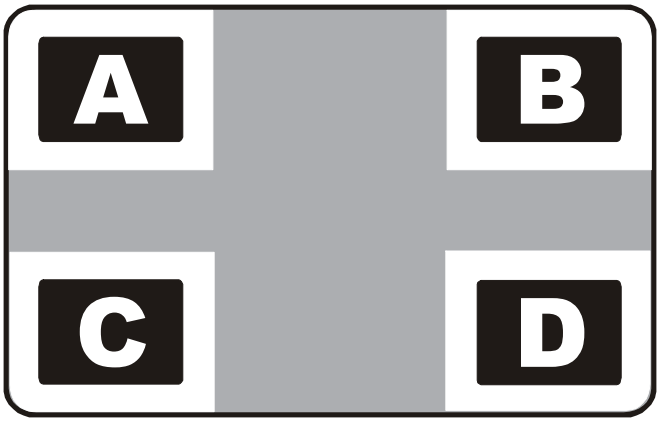
Sample 2: VeriMark Card (Portrait - Orientation) - 4 positions (below)



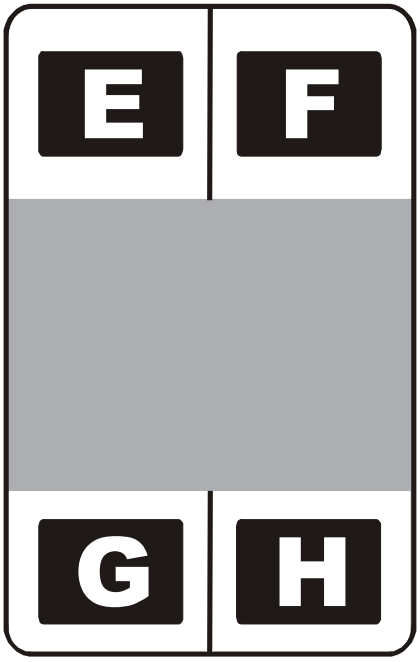
Reviewing the Custom HoloMark Card (Custom Graphic in a 2D foil)

The custom HoloMark image is stamped on blank, standard-sized cards. You can select one of eight positions (A to H), as shown in the Portrait and Landscape samples below.

Sample 1: HoloMark Card (Landscape - Orientation) - 4 positions (below)



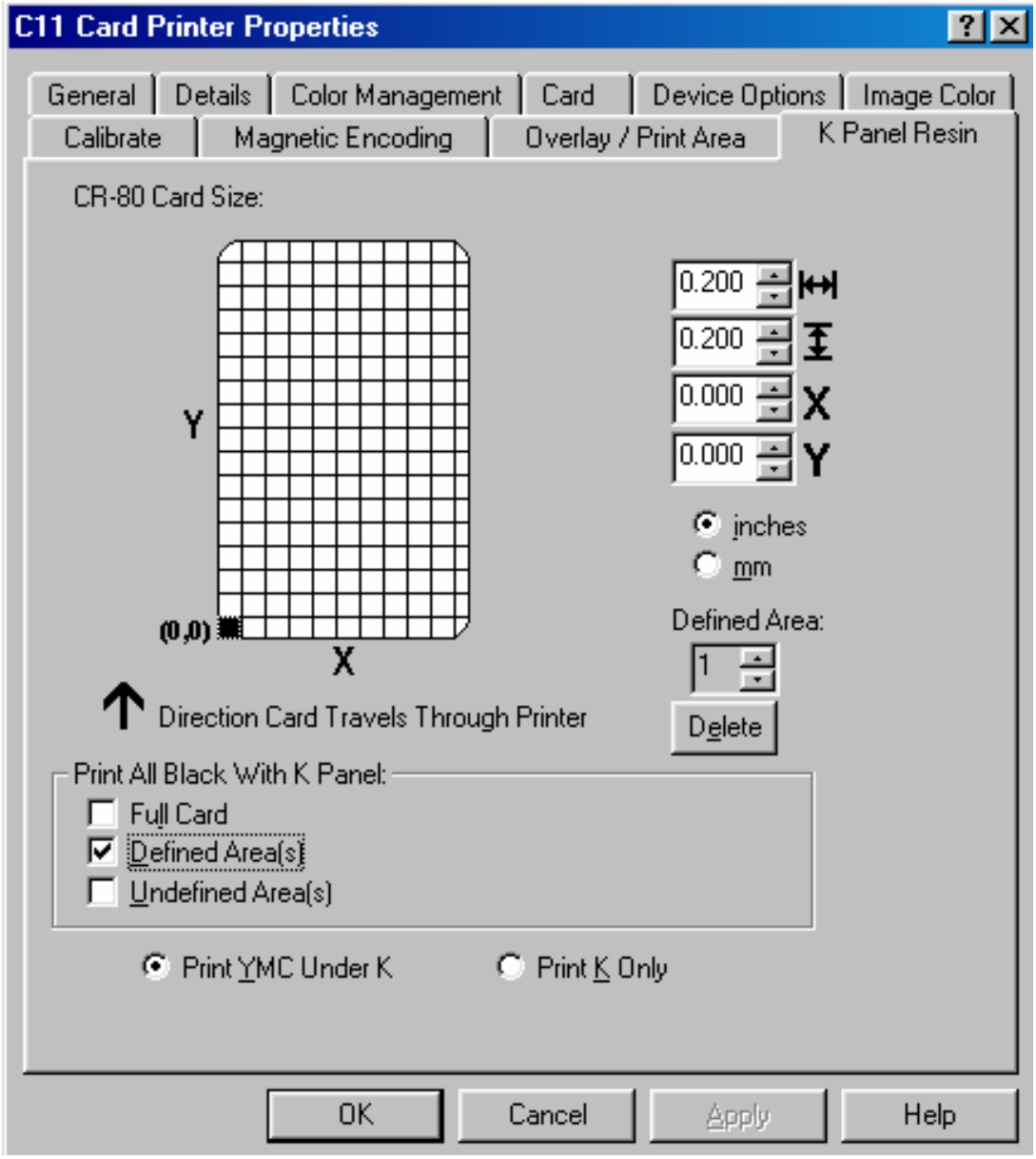
Sample 2: HoloMark Card (Portrait - Orientation) - 4 positions (below)



Using the K Panel Resin tab

Select the **K Panel Resin** option to control where the resin black (K) panel of a full-color ribbon is printed.

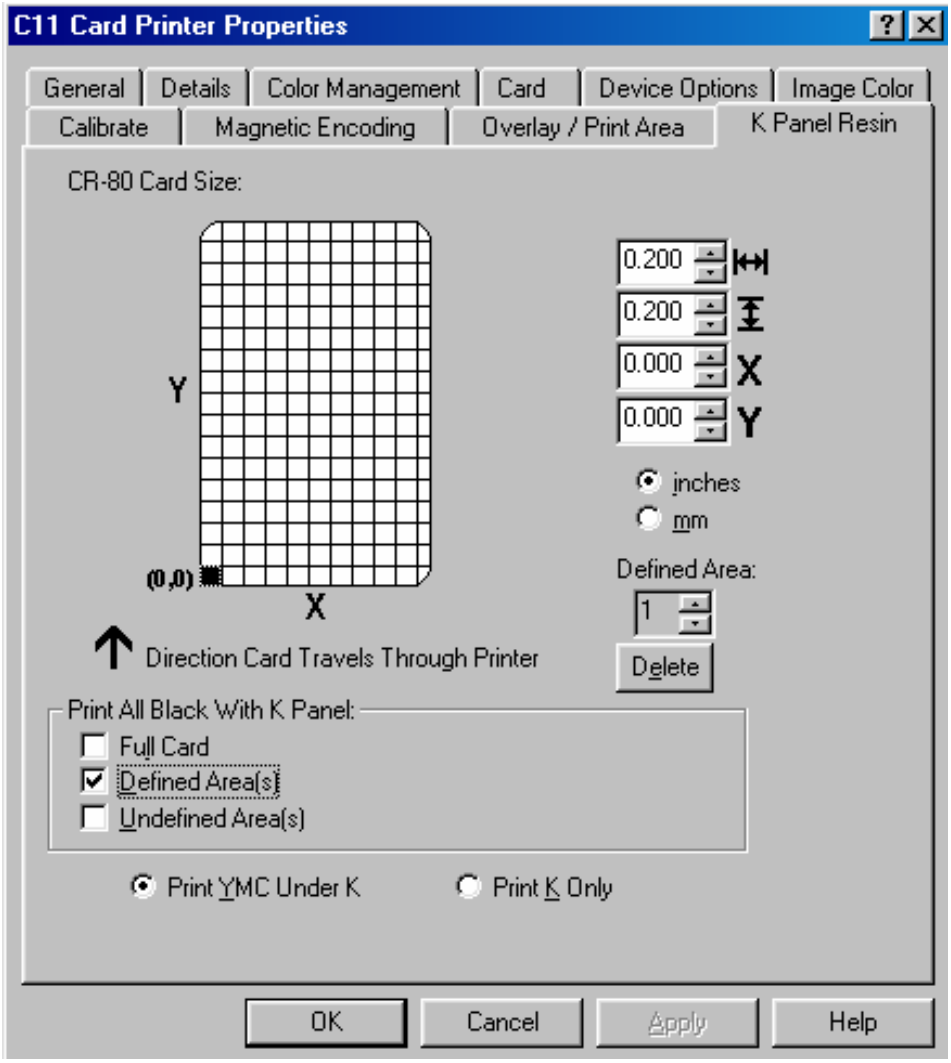
- If printing with a resin-only ribbon type all K Panel Resin options will be grayed out.
- Resin black text is desirable due to its sharp, saturated black coloring and resin black bar codes are often required by Ultra Violet barcode readers to ensure readability when scanned.)



Selecting from the Print All Black With K Panel options

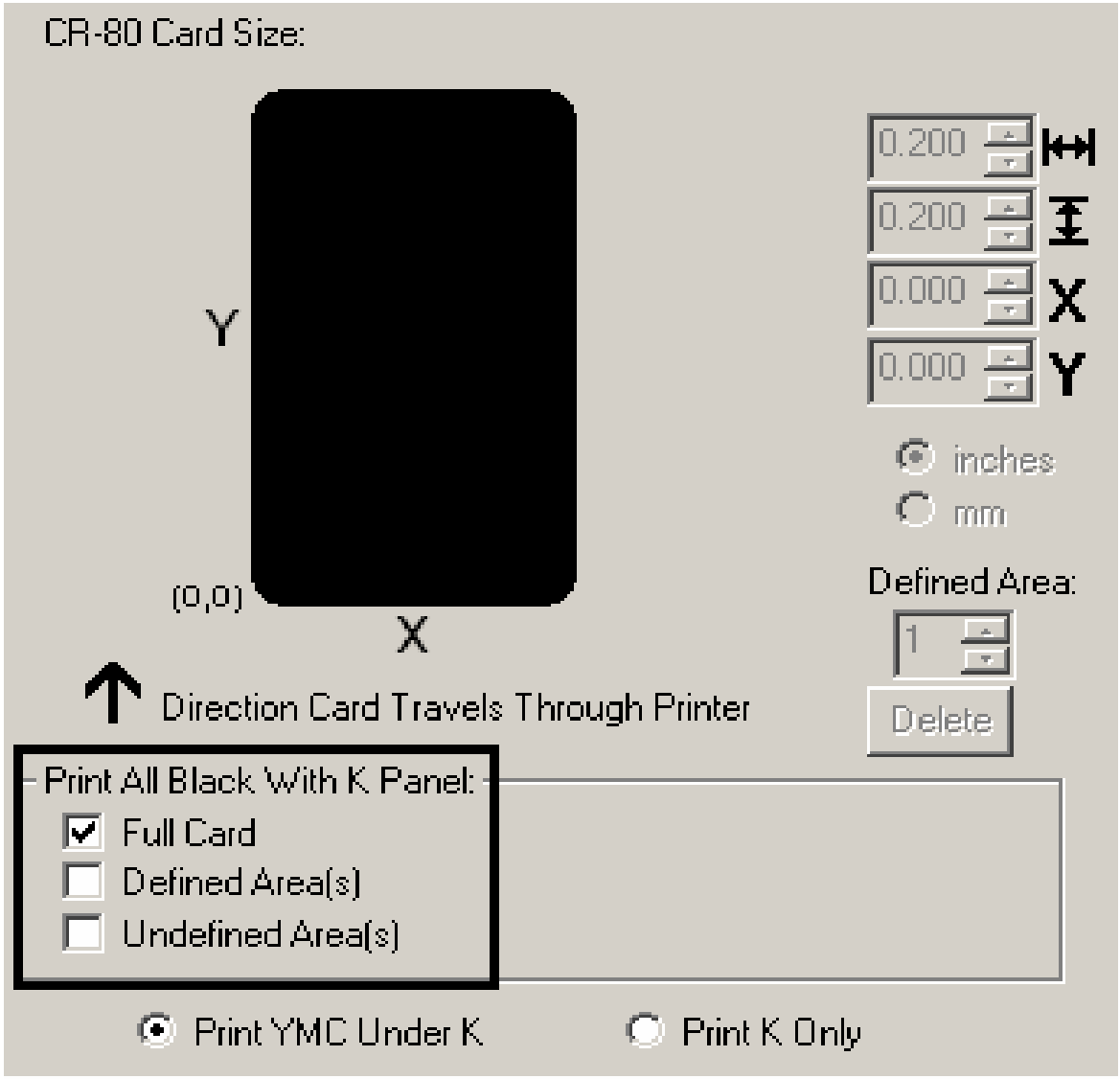
Select one of the three options listed under **Print All Black With K Panel** if the black text or bar codes are not TrueType fonts and/or are not printing with the resin black panel. (**Note:** The Printer driver will print areas of the image where it finds black coloring with the print ribbon's resin black (K) panel as specified by each of the following options.

Step	Procedure
1	When none of the options within this window are selected, the Printer driver will automatically print all TrueType black text and bar codes only with the Resin Black (K) Panel of the print ribbon.



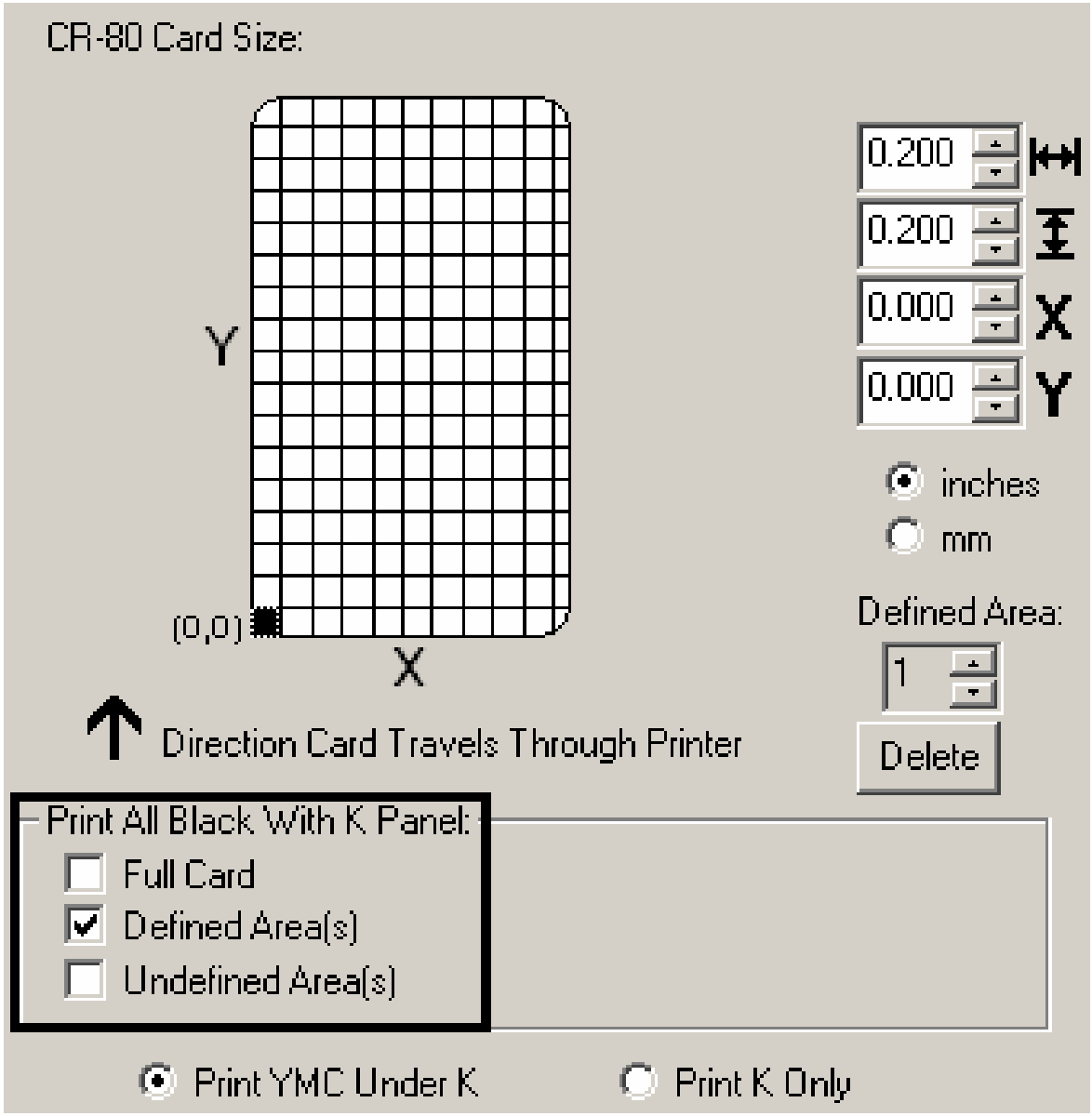
Selecting the Full Card option

Step	Procedure
1	Select the **Full Card** option for the Printer driver to print the resin black (K) panel for all black found within all areas of the image.



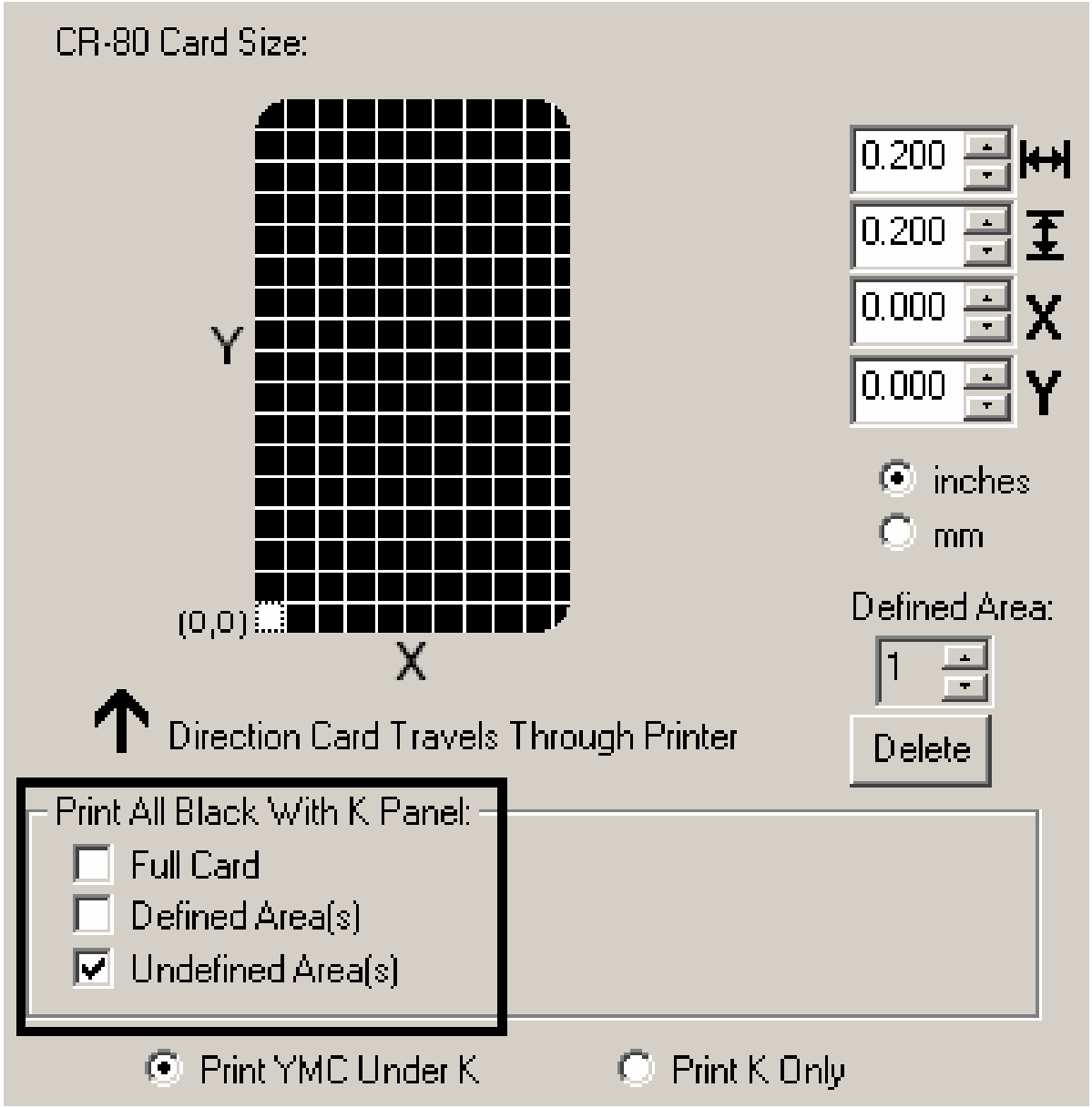
Selecting the Defined Area(s) option

Step	Procedure
1	Select the **Defined Area(s)** option for the Printer driver to print the resin black (K) panel for all black found only in a desired and defined area or areas.



Selecting the Undefined Area(s) option

Step	Procedure
1	Select the **Undefined Area(s)** option for the Printer driver to print the resin black (K) panel for all black found only in the space outside the defined areas. (**Note:** In the card grid, black indicates the area in which the resin black (K) panel will be printed.**)**

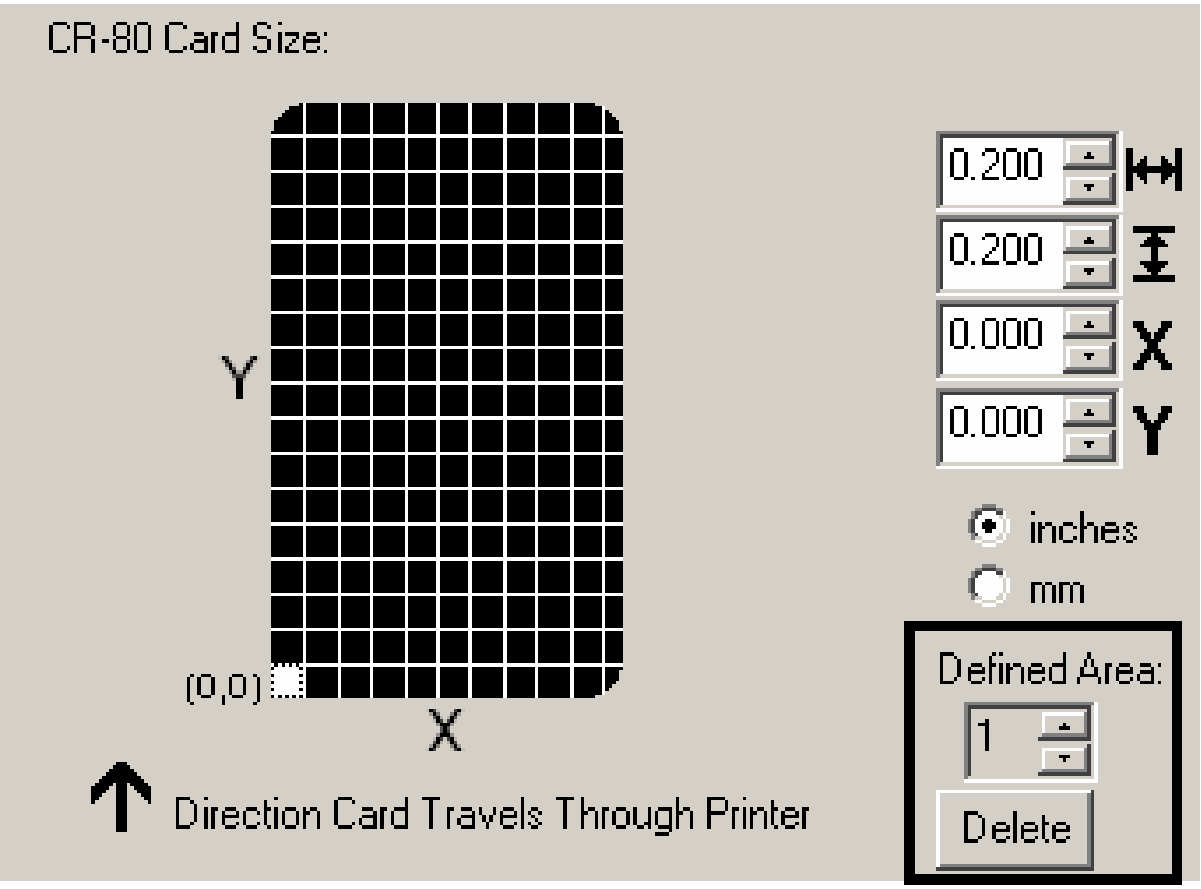


Selecting the Defined Area(s) function

To define an area, refer to the following steps:

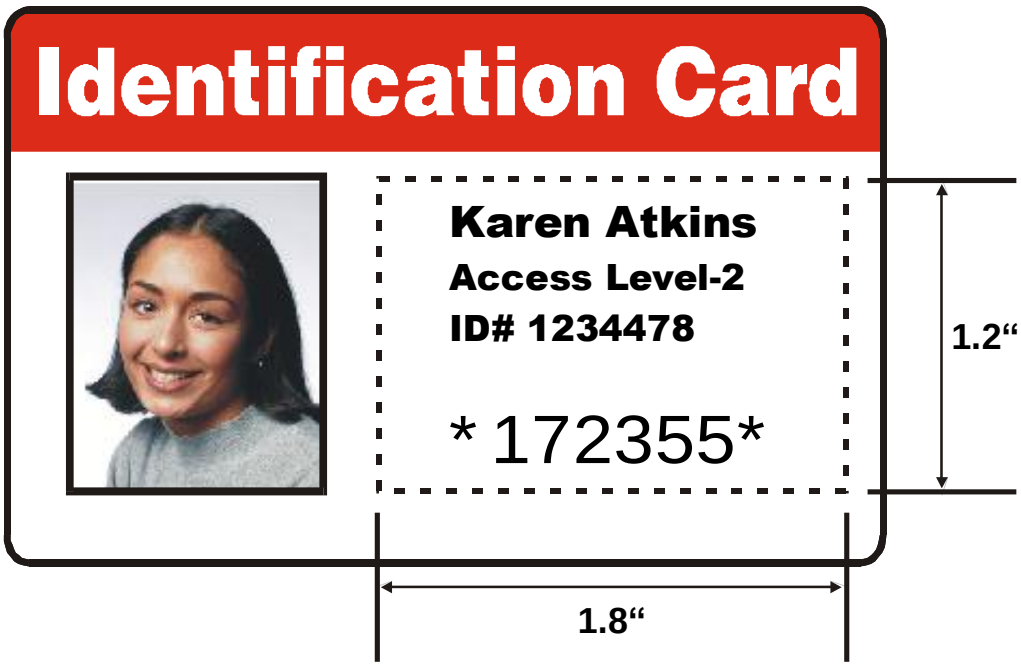
Step	Procedure
1	Click on the **Defined Area(s)** check box. (**Note:** This will activate the card grid in the upper half of the window. It is through this card grid that up to five areas can be defined.) When the card grid is first activated, a small square will appear at its default size of .2" x .2"/5mm x 5mm and at its default location in the lower left-hand corner (0,0). This square represents the first defined area. (**Note:** Changing the orientation of the card in the Card Tab will change the appearance of this Tab.)

Continued on the next page



Selecting the Defined Area(s) function (continued)

Step	Procedure
2	a. Determine the area of the card necessary to define. In the sample (below), this area is indicated by the dashed outline. b. Determine the size of this area by actually printing a card and looking at it in the same orientation as when it exits the Printer.
3	Measure the total size for the area and enter those dimensions into the dimension boxes. (**Note:** The minimum size an area can be is .2" x .2"/5mm x 5mm.)



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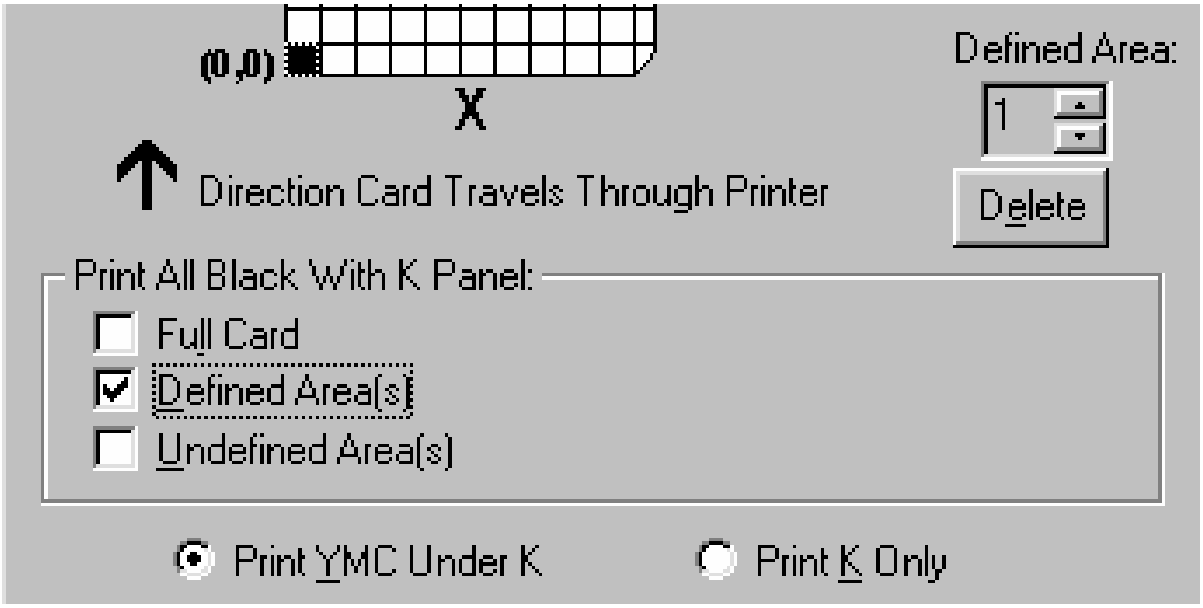
Selecting the Defined Area(s) function (continued)

Step	Procedure
4	a. Once the area is sized properly measure from the lower left corner of the card up and over to the lower left corner for the defined area to begin. b. Enter these values into the X and Y boxes. (**Note:** The card grid lines are spaced at .2 inch/5mm intervals.)
5	a. Print the card design and note how the image is oriented on the card as it ejects from the Printer. (**Note:** The location of a defined area is based on the card orientation as it exits the Printer.) b. Measure the defined area location based on the printed card. (**Note:** If selecting the **Rotate Front 180 Degrees** option, the image will appear upside-down as it exits the Printer. In this case, position the defined area opposite to the measurement from the onscreen card design, which will appear right side up.)

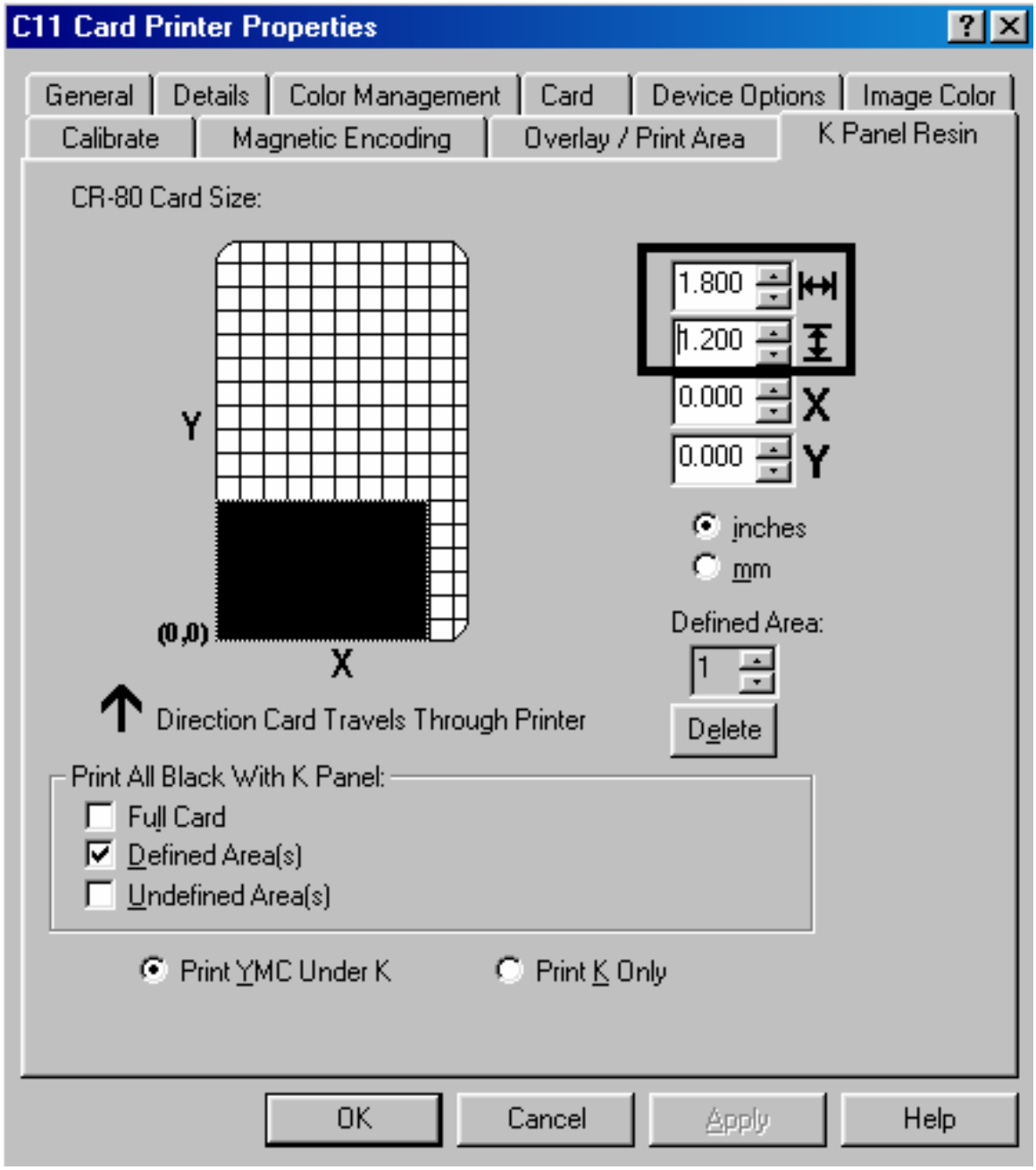
Continued on the next page



Continued on the next page

Selecting the Defined Area(s) function (continued)

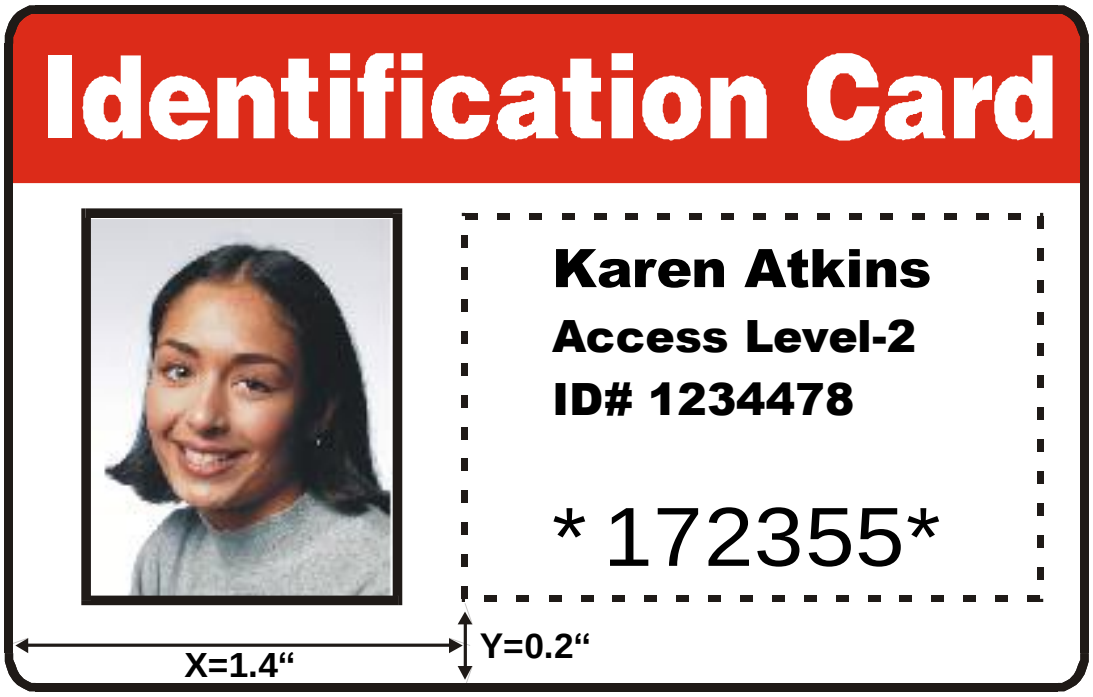
Refer to the previous procedure.



Continued on the next page

Selecting the Defined Area(s) function (continued)

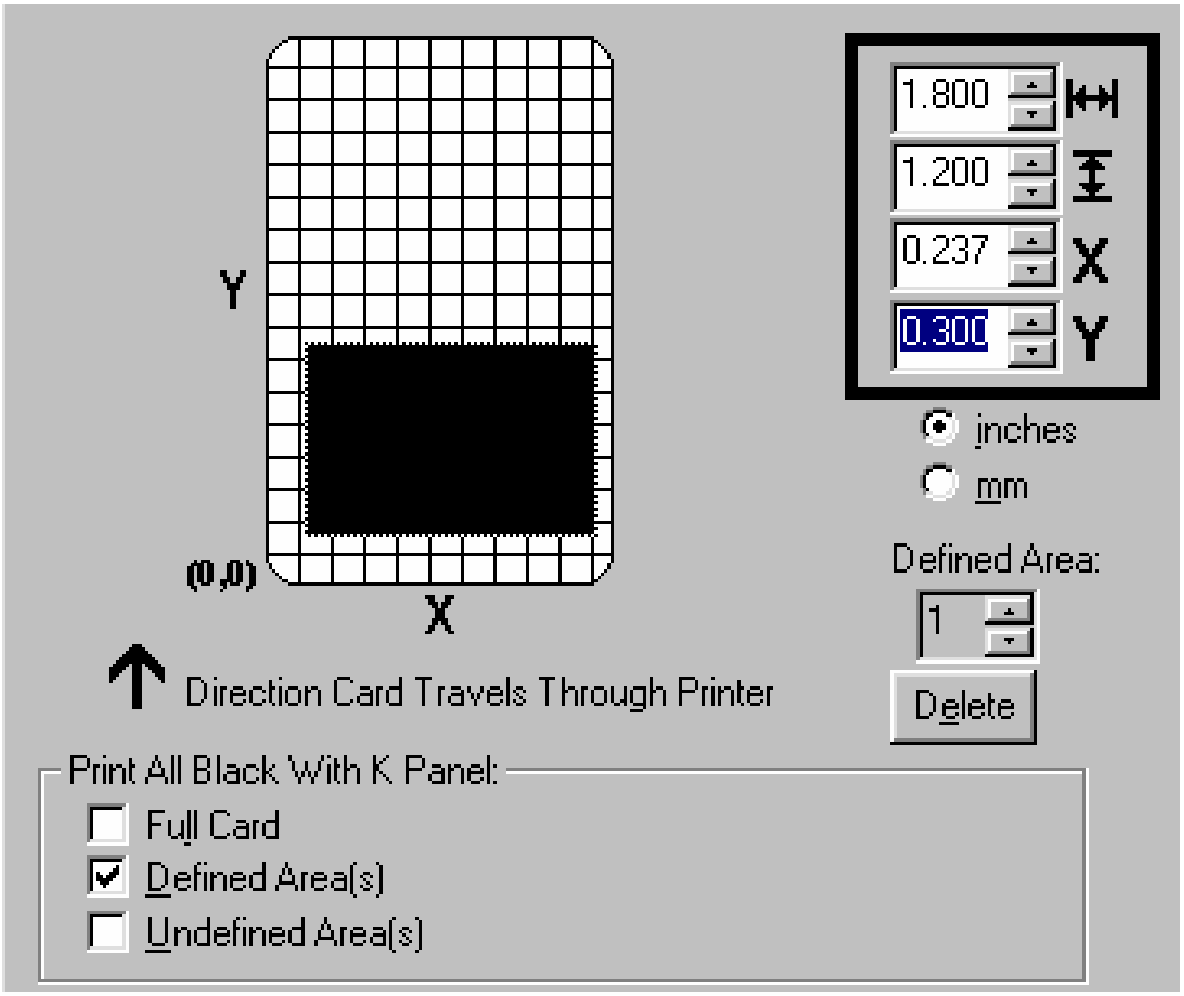
Refer to the previous procedure.



Continued on the next page

Selecting the Defined Area(s) function (continued)

Refer to the previous procedure.



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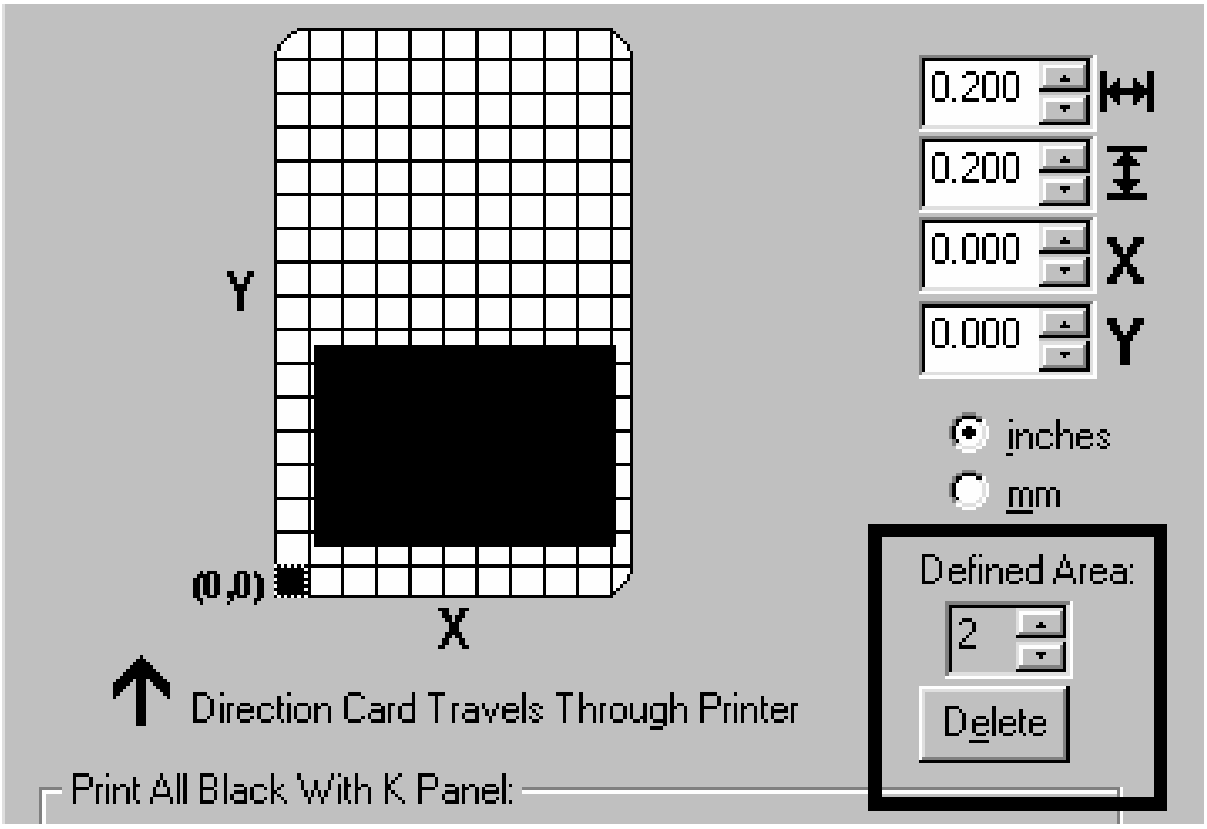
Selecting the Defined Area(s) function (continued)

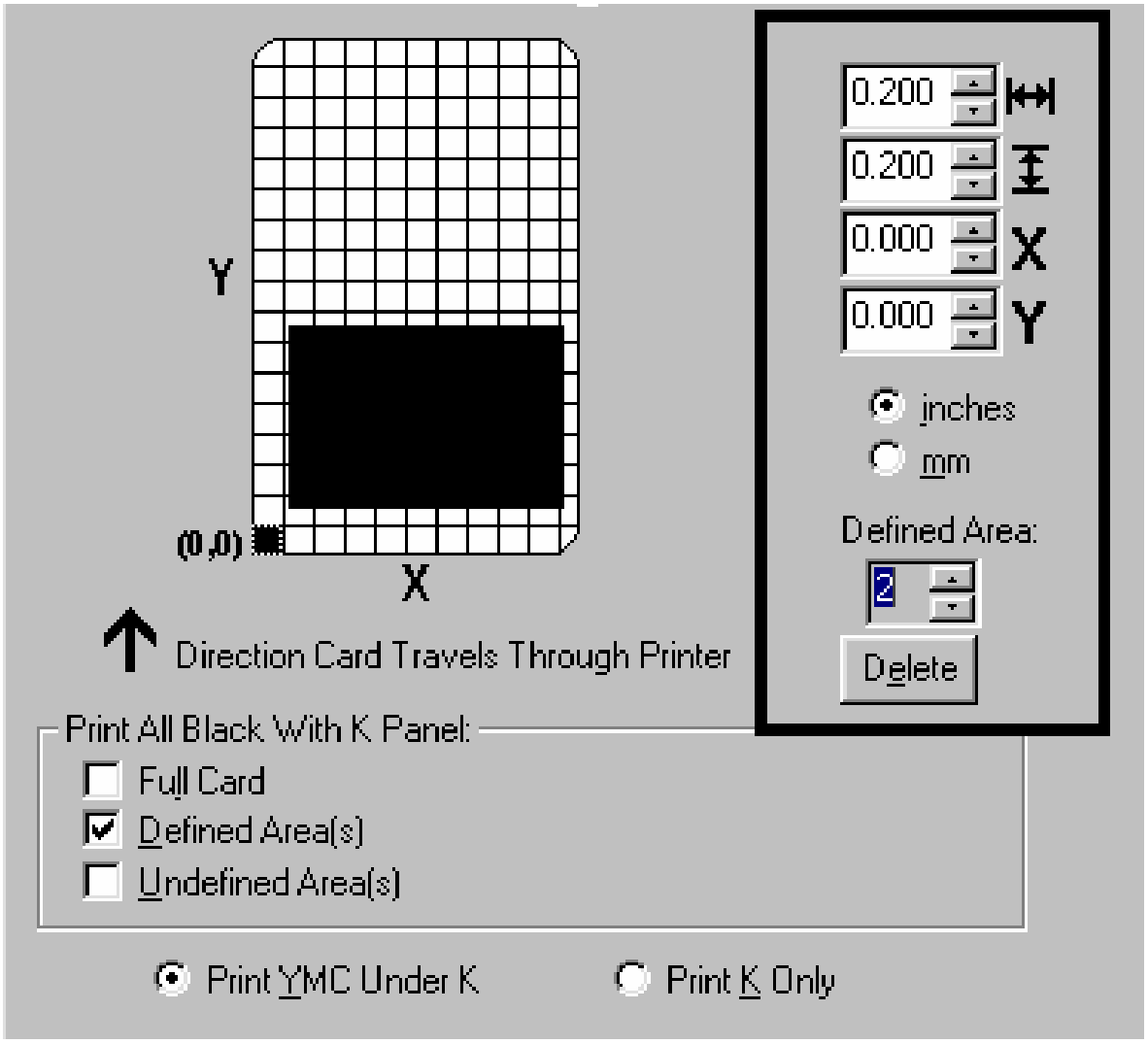
Step	Procedure
6	Define another area by clicking on the **Defined Area** up arrow. (**Note:** Another .2" x .2"/5mm x 5mm area will appear in the lower left-hand corner. This is the location in which all newly defined areas will first appear.)
7	a. Use the **Defined Area** arrows to navigate back and forth from area to area. (**Note:** The active area will always be highlighted with a dotted outline. Up to 5 areas can be defined.) b. Size and position each area as it is created because additional areas cannot be added until the most recently created area has been moved or sized.
8	Delete an area by using the Defined Area arrows to select the area and clicking on the **Delete** button. (**Note:** If all areas are deleted, the K Panel Resin options will automatically be deselected.)



Continued on the next page

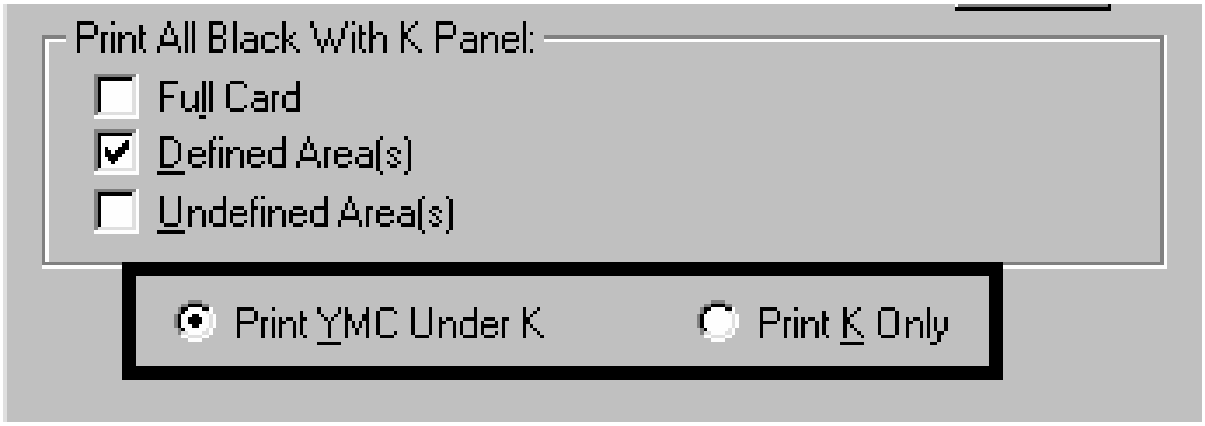
Selecting the Defined Area(s) function (continued)

Refer to the previous procedure.



Selecting the Print YMC under K and Print K Only options

Step	Procedure
1	• Select between the **Print YMC Under K** and **Print K Only** options. (**Note:** When the **Print YMC Under K** option is selected, all black in the designated areas will print with the Yellow (Y), Magenta (M) and Cyan (C) ribbon panels directly beneath the resin black (K) panel.) **OR** • Select this option if printing resin black text or bar codes onto a colored background to provide a more gradual transition between the two.
2	Select the **Print K Only** option if printing resin black onto a white background to maximize the sharpness of printed text and bar codes. (**Note:** When this option is selected, all black in the designated areas will print only with the resin black (K) panel.)

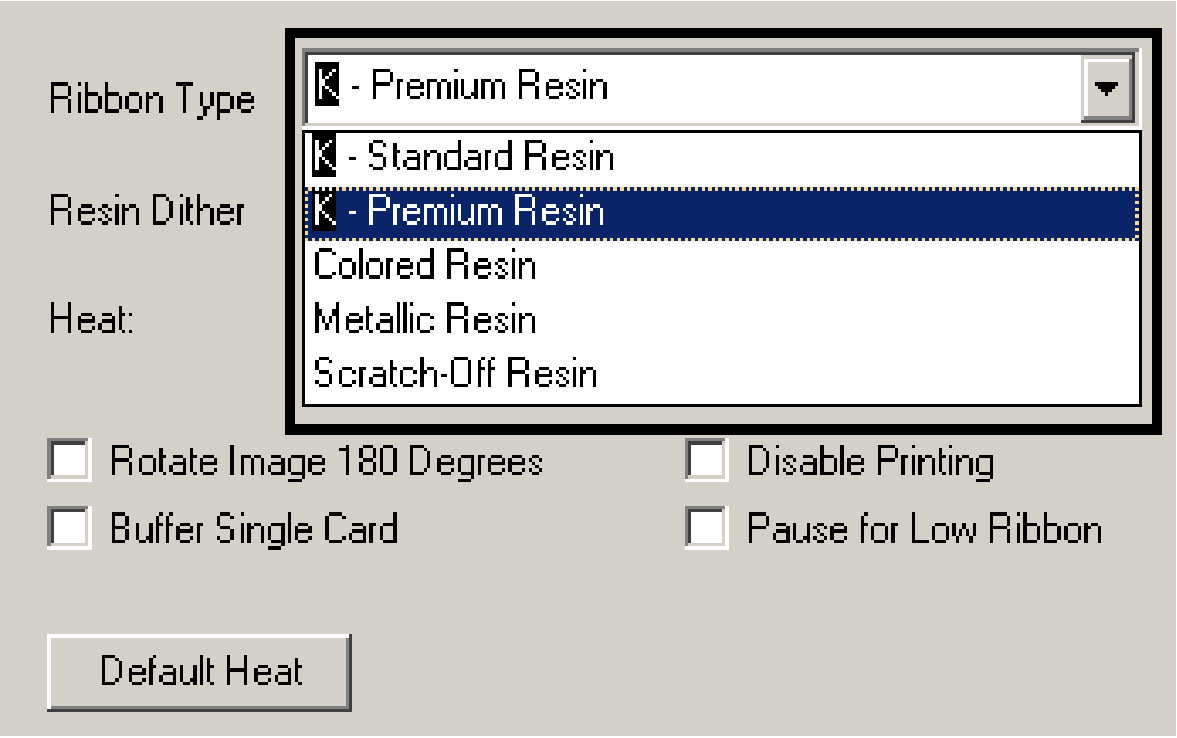


M11 Printer Driver Options

Selecting from the Ribbon Type option

Use the Ribbon Type option to select print ribbons.

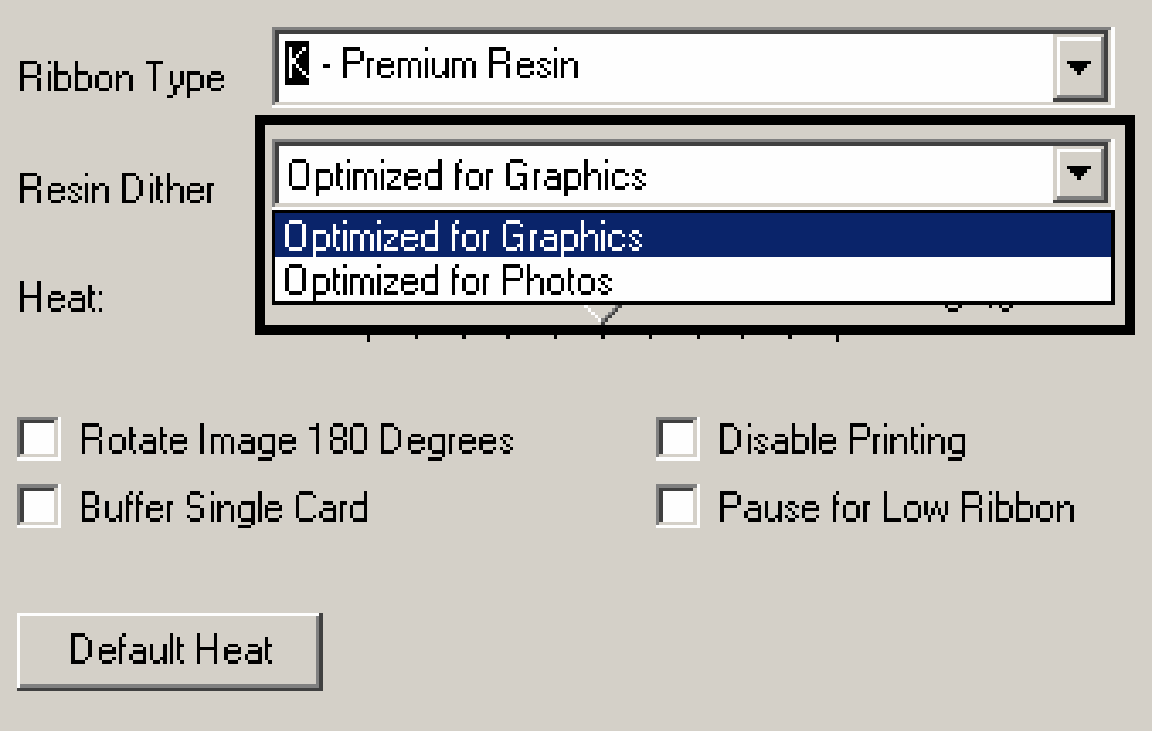
Step	Description
1	Select the appropriate print **Ribbon Type** option from the dropdown menu for the type of print ribbon in use. • K – Standard Resin • K – Premium Resin • Colored Resin • Metallic Resin • Scratch-Off Resin



Adjusting for the Resin Dither

Select the appropriate dither method according to the type of image to be printed. (**Note:** This option affects objects printed with a resin-only print ribbon or those objects printed with the resin black panel of a YMCKO print ribbon.)

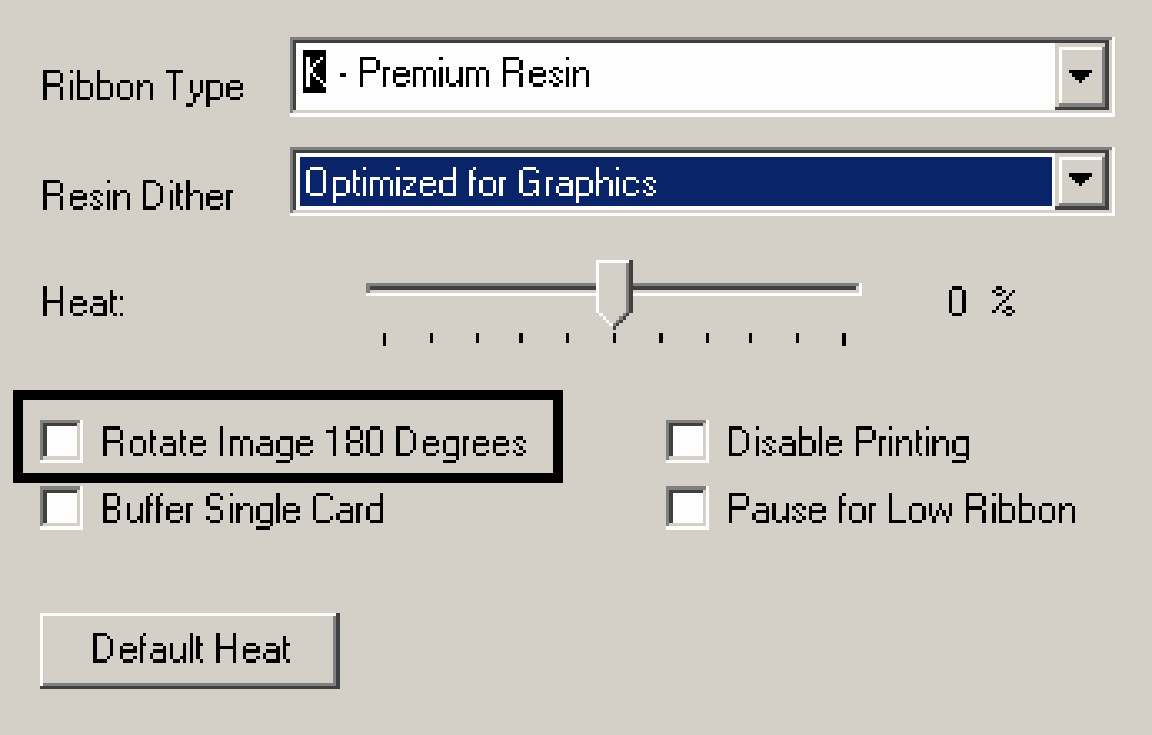
Step	Procedure
1	Select **Optimized for Photo** when printing photo quality images with resin. **OR** Select **Optimized for Graphics** when printing drawings and graphics (e.g., clipart, logos, etc.) with resin.



Selecting the Rotate Image 180 Degrees option

Use this option to rotate the image on the front of the card 180 degrees when printed.

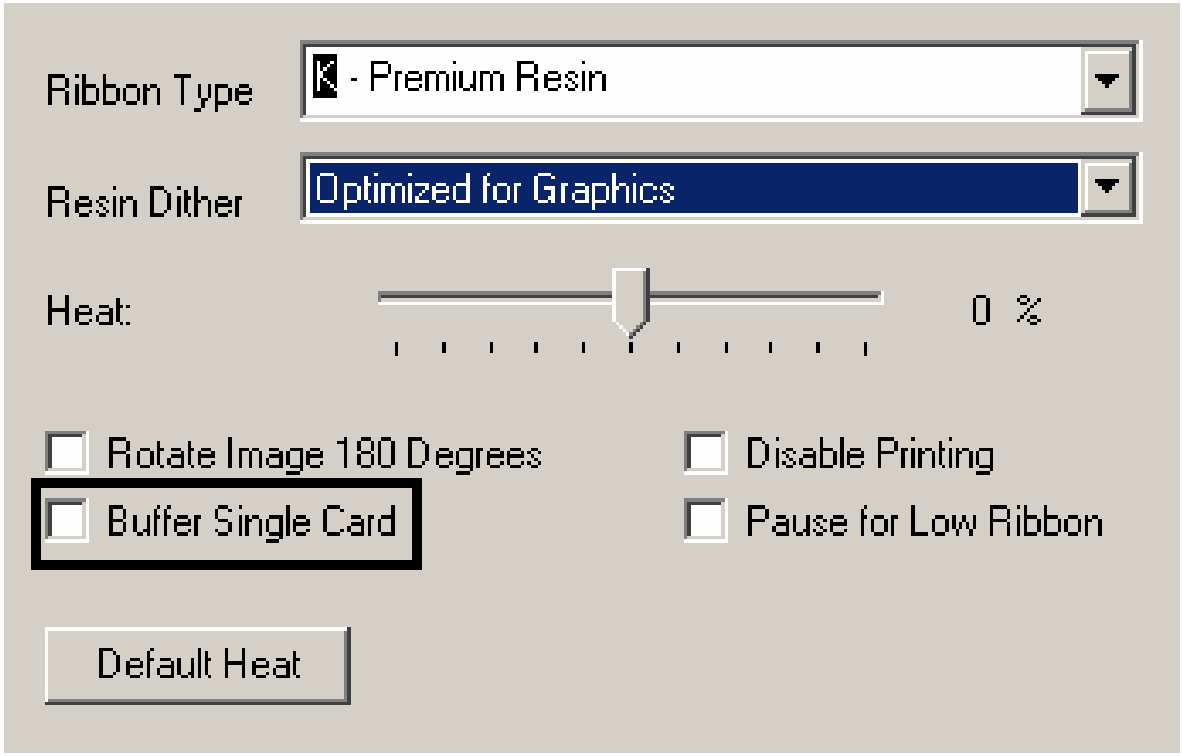
Step	Description
1	Select this option to change the position of the printed image in relation to the set location of a card's Magnetic Stripe or smart chip.



Selecting the Buffer Single Card option

Use this option to force the Printer's memory to buffer or hold, only one print job at a time.

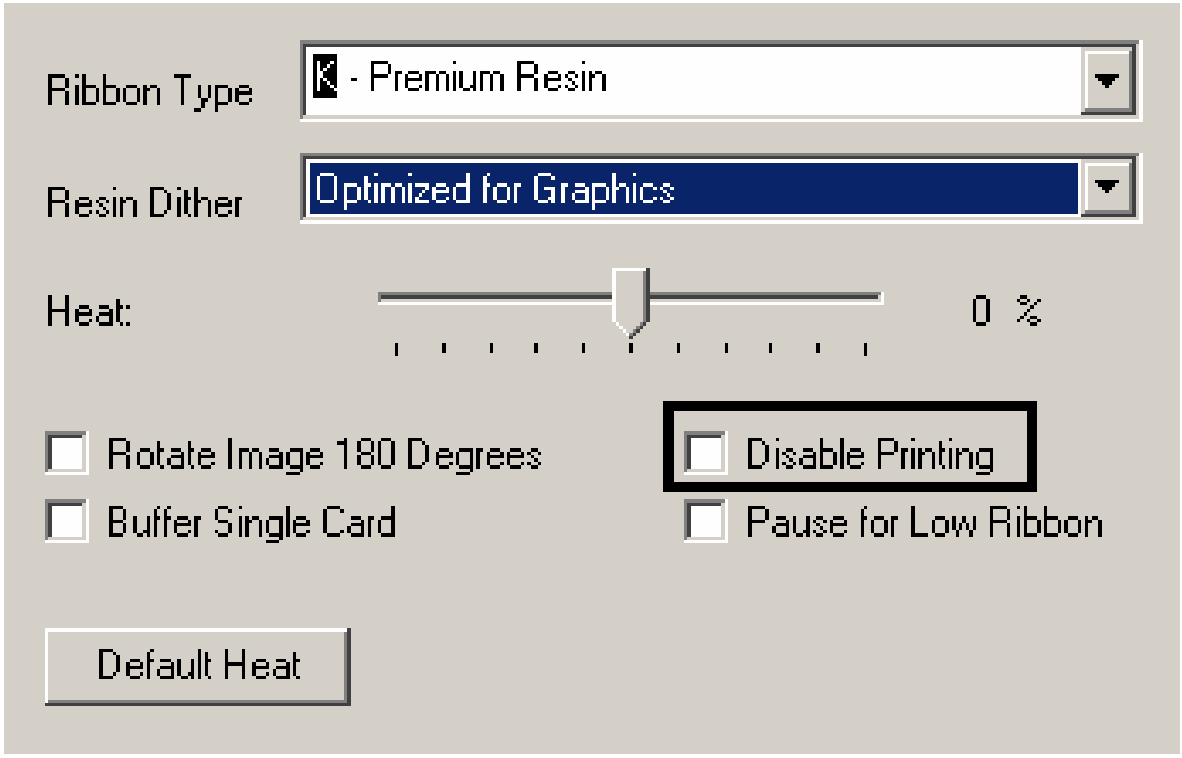
Step	Description
1	Select this option only when printing to multiple Printers that share print jobs over a network. (**Note:** This option ensures all Printers evenly share all print jobs. Normally, when this option is not selected, the Printer's memory will buffer as many print jobs as it can until the Printer's memory is full. This is ideal for most applications where Printers are not networked together.)



Selecting the Disable Printing option

Use this option to disable the printing capabilities of the Printer, yet still allows the Printer to encode cards.

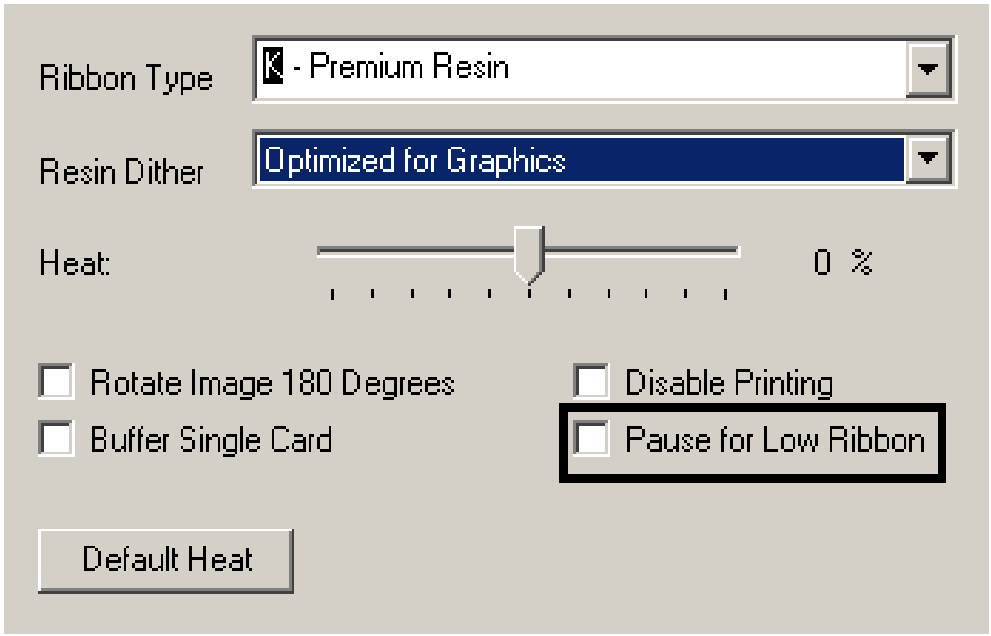
Step	Description
1	Select this option to encode or re-encode cards without wasting additional time, effort or printing supplies. (**Note:** When this option is selected, no print data will not be sent to the Printer, while all encoding instructions will be sent according to how they are configured within the software.)



Selecting the Pause for Low Ribbon option

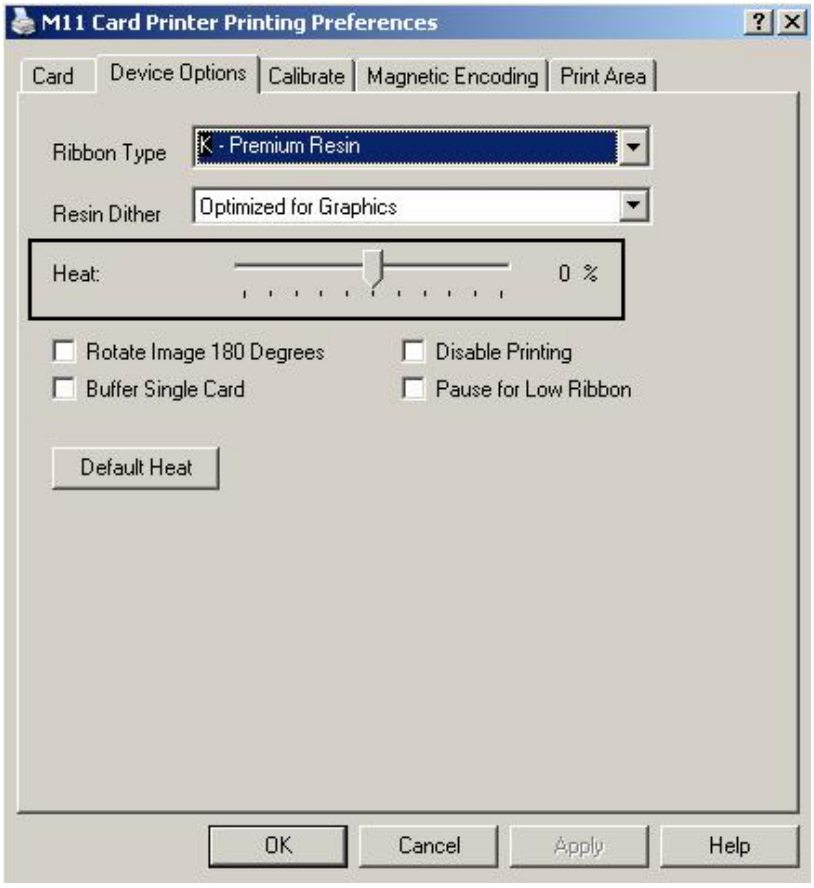
Use this option as a definitive warning when running low on print ribbon. (**Note:** Select this option so the Printer will beep and pause and the Media LED will flash when approximately 10 to 20 prints remain on the print ribbon.)

Step	Description
1	Replace the ribbon and press the Media button to continue printing with a new ribbon **OR** Leave the existing ribbon in Printer and press the **Media** button. • When this option is selected, once the **Media** button is pressed, the Printer will continue printing until the end of the ribbon and will beep once before each print job. (**Note:** It will not be necessary to press the **Media** button again to continue printing once it has been pressed initially during a batch print.) • When this option is not selected, the Printer will still beep once before each print job when approximately 10 to 20 prints remain on the print ribbon, however, the Printer will not pause. (**Note:** Instead, it will continue printing until the end of the ribbon, without user intervention.)



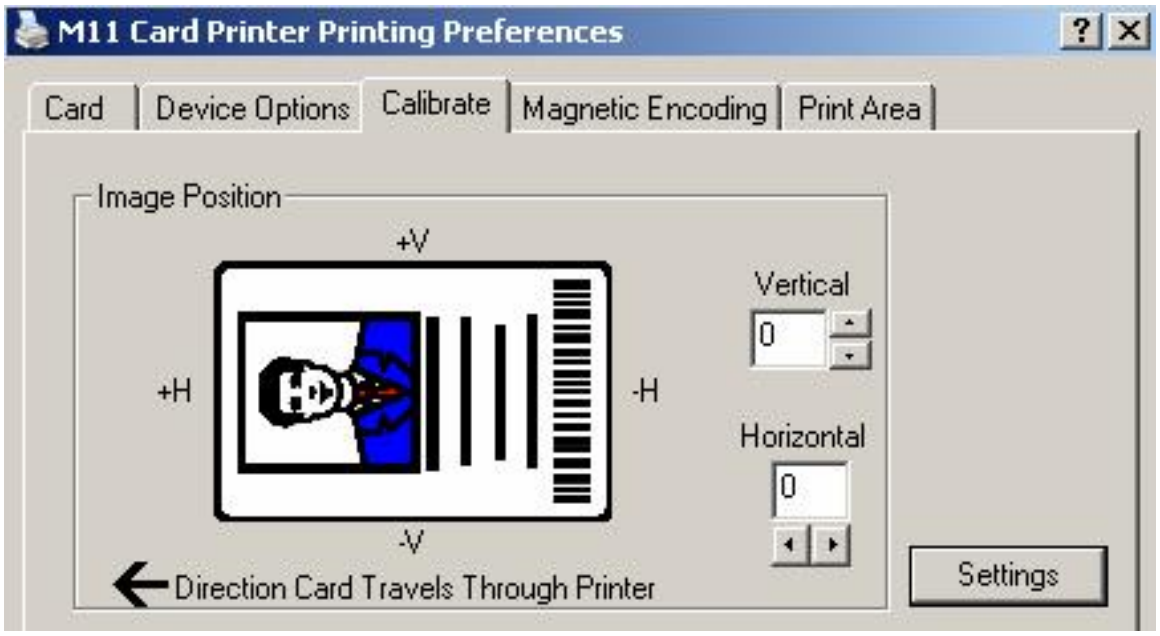
Selecting the Heat (M11 only) option

Step	Description
1	Use the **Heat (M11 only)** option by adjusting the **Heat** slide to control the amount of heat (that the Printer uses when printing with the monochrome resin ribbon). • Move the slide to the left to cause less heat to be used in the printing process, causing resin images to be lighter or less saturated. • Move the slide to the right to cause more heat to be used, causing resin images to be darker or more saturated. (**Note:** This control can be helpful for fine-tuning the saturation of resin text and bar codes. Click on the **Default Heat** button to return the slide to its default setting of 0.)



Using the Calibrate tab

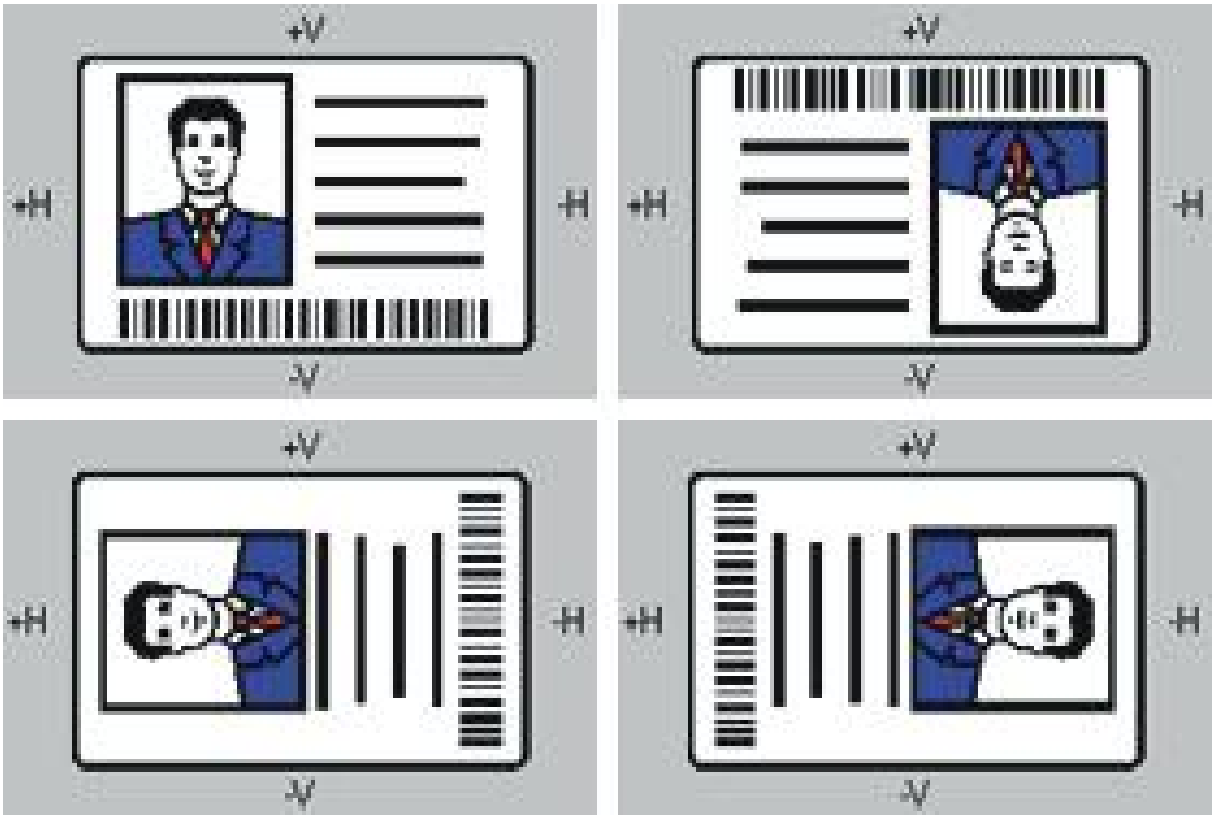
Use the Calibrate tab to (a) control the position of the printable area in relation to the card, (b) calibrate Sensors and (c) adjust the internal Printer settings that are customized for every Printer and saved directly within the Printer's memory.



Using the Image Position Controls

Use the **Image Position** controls to adjust the position of the overall print area to be precisely centered on a card.

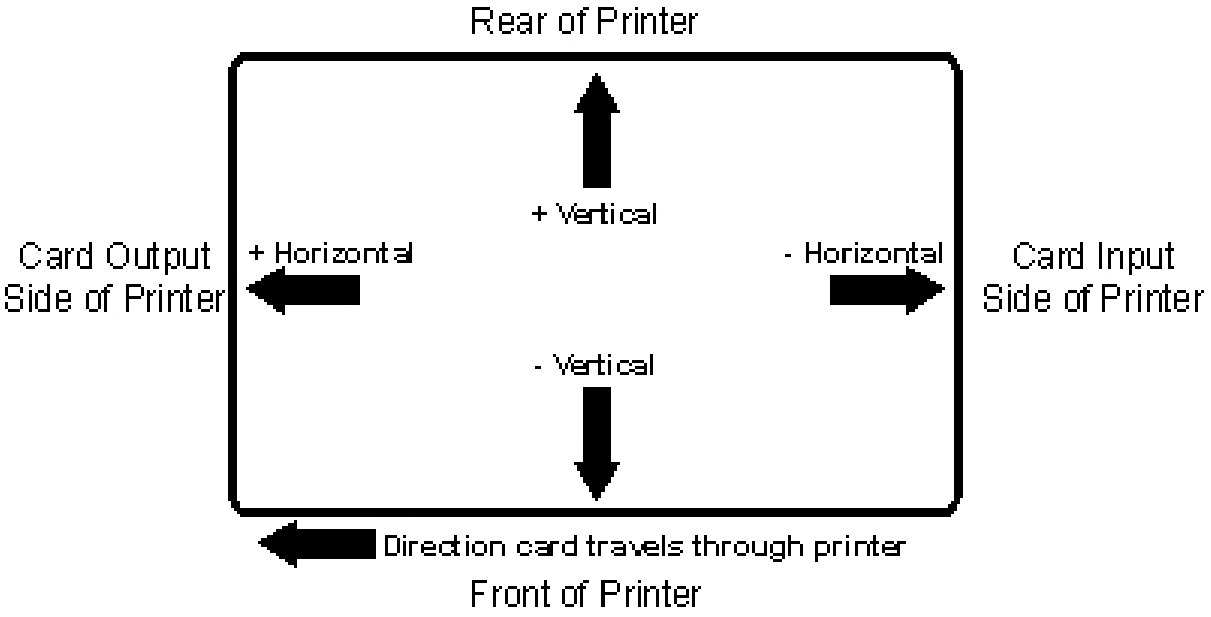
Step	Procedure
1	Click on the **Vertical** and **Horizontal** adjustment arrows to adjust the Image Position values. • When adjusting these values, keep in mind that cards always remain in the same position while moving through the Printer, regardless of image orientation. • To illustrate this, the card illustration shown in the Image Position box will flip and rotate according to the **Portrait**, **Landscape** or **Rotate 180 Degrees** selection. • The outline around the illustration will always remain in the same **Landscape** orientation.



Using Image Position controls (continued)

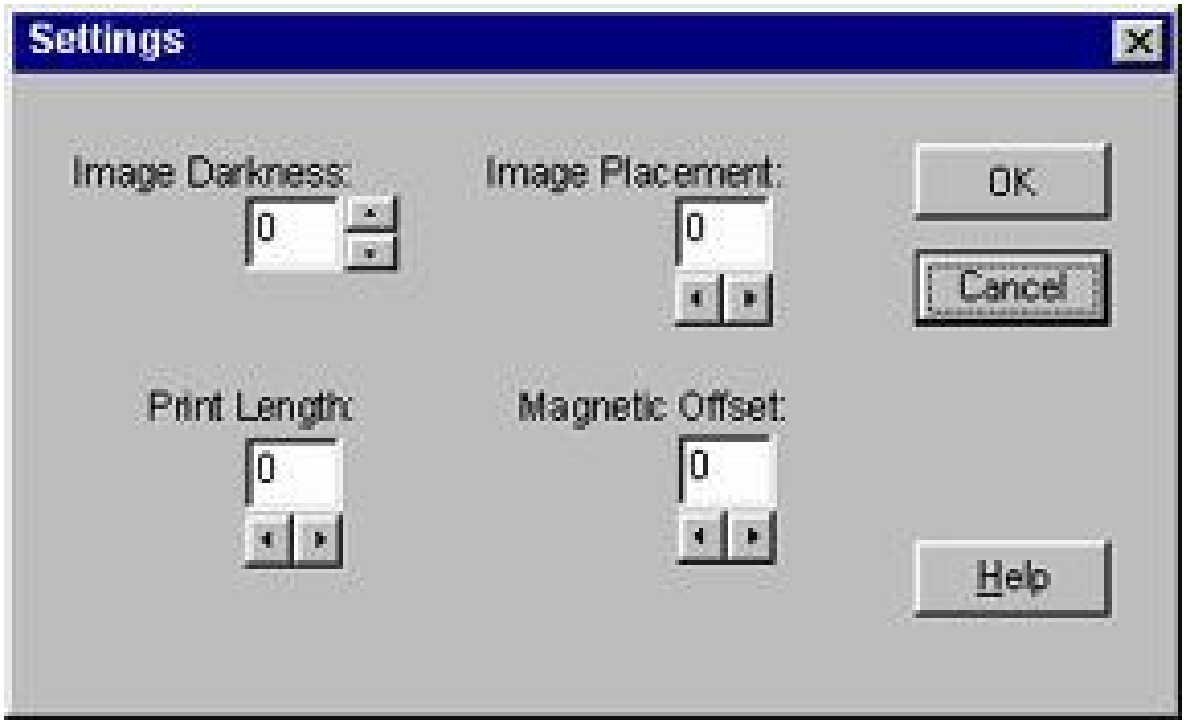
Review the Image Position diagram, which displays how the printed image will move in relation to the fixed card position as positive and negative image placement values are entered.

Step	Procedure
2	Use the **Vertical** adjustment to move the image: • Move toward the rear of the Printer if a positive number is entered. • Move toward the front of the Printer if a negative number is entered. **OR** Use the **Horizontal** adjustment to move the image: • Move toward the card output side of the Printer if a positive number is entered. • Move toward the card input side of the Printer if a negative number is entered. (**Note #1:** The maximum value for the **Vertical** and **Horizontal** adjustments is ±100 pixels (10 pixels = about .03"/. 8mm).) (**Note #2:** The **Vertical** and **Horizontal** adjustment arrows point to within the Image Position window, which represents the direction that the printed image moves.)



Using the Settings button

Use the **Settings** button (see previous page) to bring up a separate dialog box for adjusting the internal Printer settings, which are customized for every Printer at the factory and saved directly within the Printer's memory. For more information see Using the Settings dialog box in section 3, page 79.

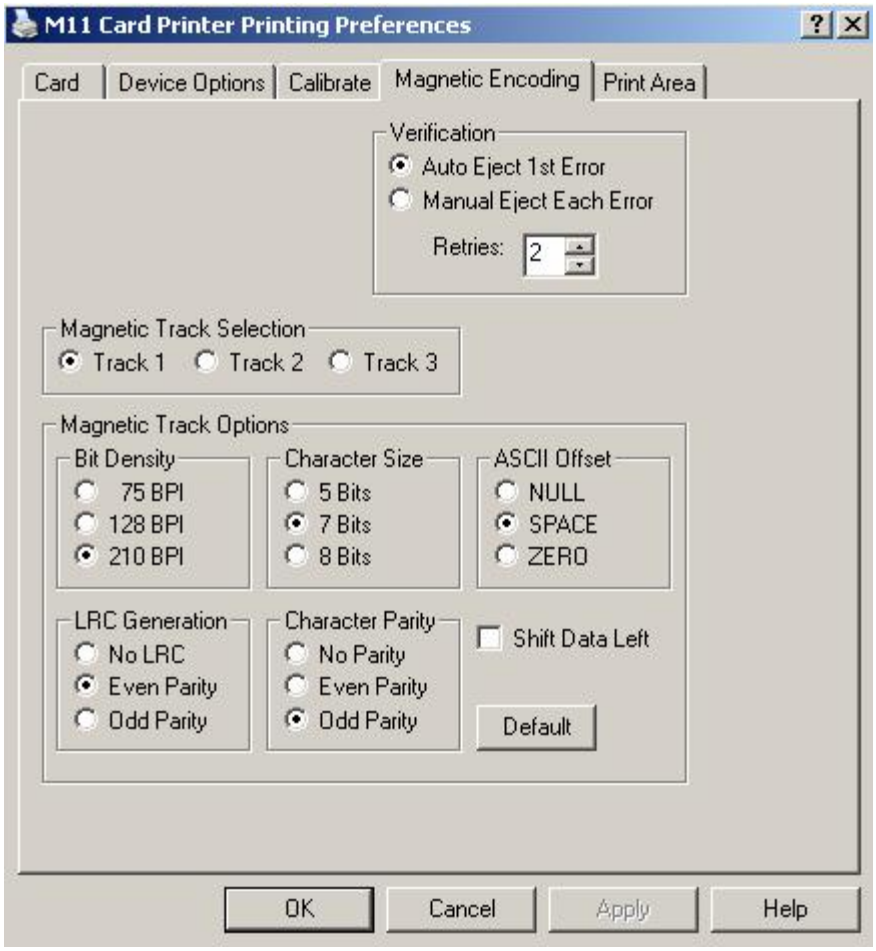


Using the Magnetic Encoding tab

Use this option only if the Printer has an optional Magnetic Stripe Encoding Module installed. The following describes these options and the Printer's magnetic encoding process.

- The Card Printer comes with either a high-coercivity factory-installed Magnetic Stripe Encoding Module or a low-coercivity module.
- The Printer cannot encode both types of Magnetic Stripes interchangeably within the same Printer.

Step	Procedure
1	Select the Magnetic Encoding tab to display options for controlling the Magnetic Stripe encoding process.

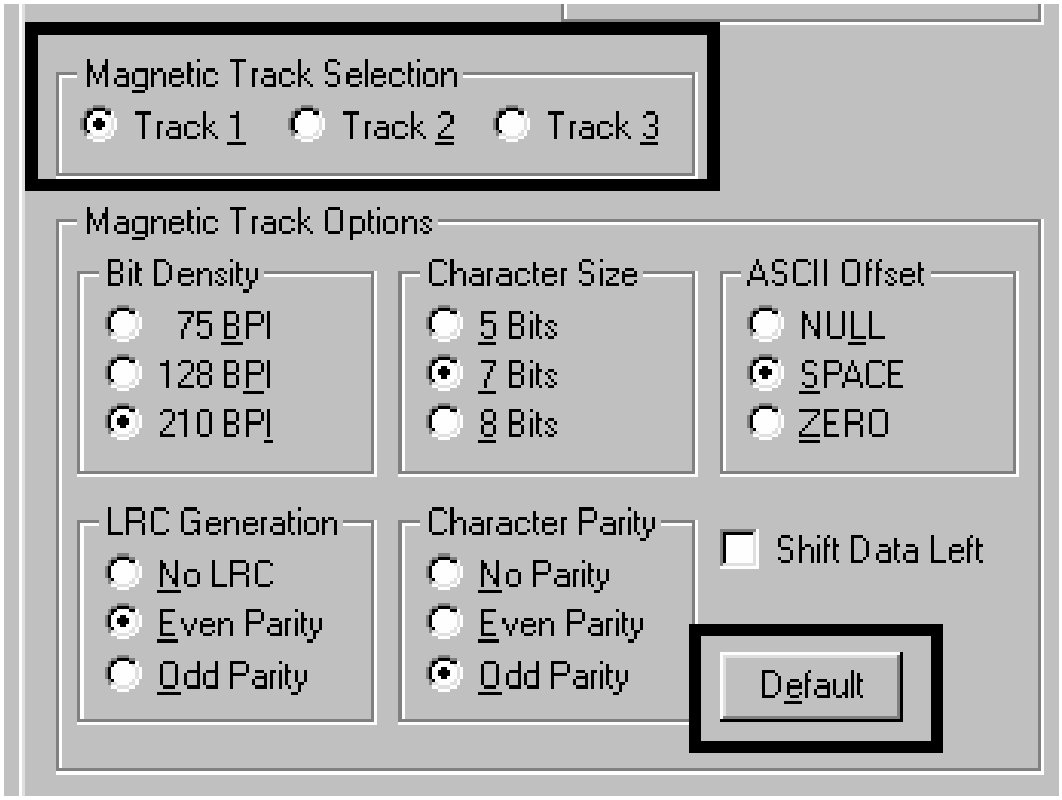


Using the Magnetic Track Selection radio buttons

Use the **Magnetic Track Selection** option to specify which track to configure through the Magnetic Track Options if the application requires customization of the standard ISO encoding process. (**Note:** Although the default ISO Magnetic Track Options should be correct for almost all applications, these options can be customized if the application requires it.)

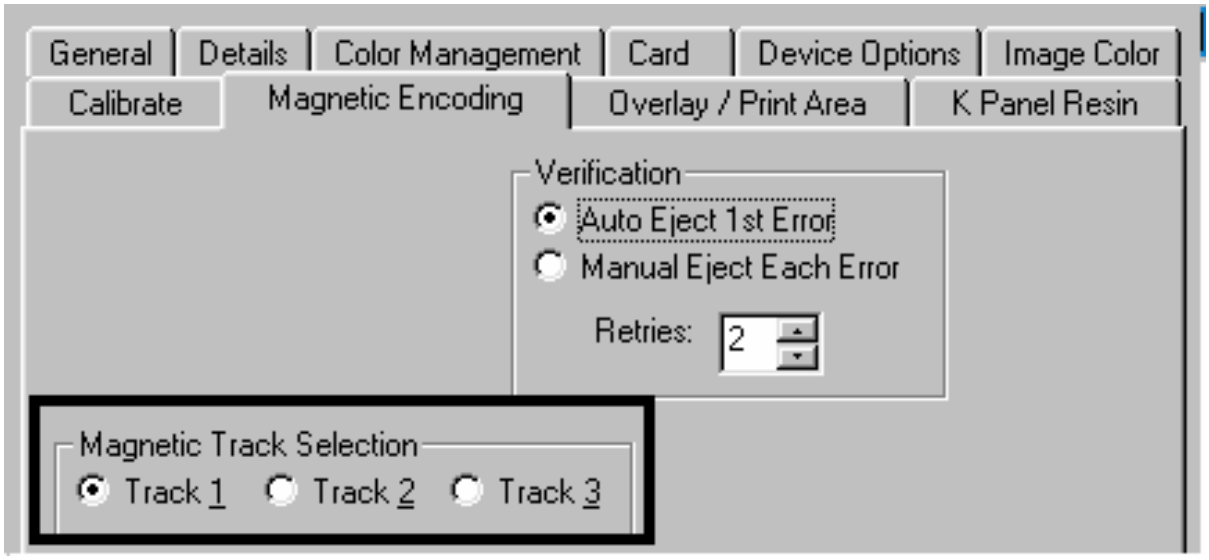
Step	Procedure
1	Select a Track selection to: c. Change all options separately for each of the three individual tracks. d. Select the **Default** button for each of the separate tracks to set these options back to the ISO Standard settings (once they have been changed). (**Important:** Please refer to the following for a description of all Magnetic Track Options.**)**

Continued on the next page



Using the Magnetic Track Selection radio buttons (continued)

Step	Procedure
2	Use the **Magnetic Track Selections** to configure the way in which each of the three magnetic tracks will encode. (**Note #1:** They do not designate which tracks the Printer will encode (e.g., to encode only Track 2). This must be done through the specific software program.) (**Note #2:** Although the Printer driver will remember the settings specified for each of the three tracks, the Printer driver will always default to displaying the options for Track 1 whenever the Printer driver setup screen is first opened.)



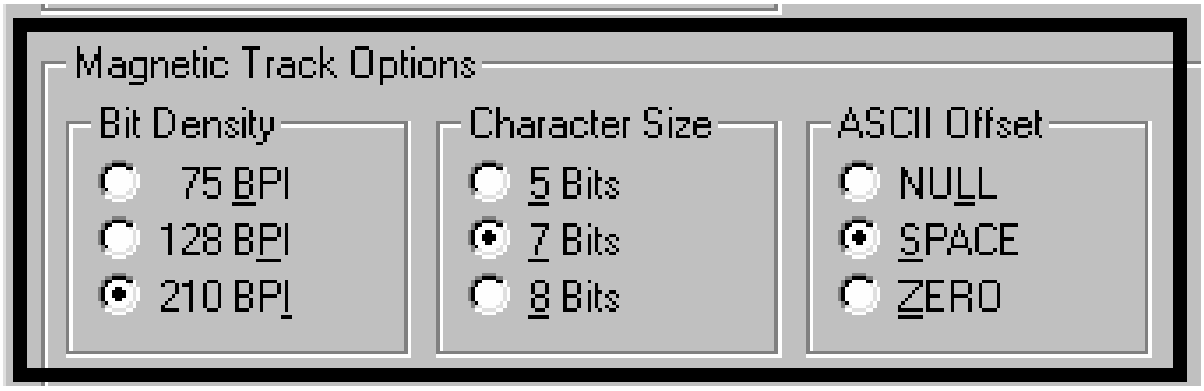
Using the Magnetic Track Options radio buttons

Use the **Magnetic Track** options for these purposes:

- Customize the ISO encoded data format for each of the Magnetic Stripe's three tracks.
- Customize each track independently of the other two.
- Specify which of the three tracks to customize by selecting one of the three track options.

(**Note #1:** After making the required selection, the Magnetic Track Options box displays the current set of customization options for the selected track.)

(**Note #2:** For most applications, the default settings for these options do not need to be changed.)



Using the Bit Density radio buttons

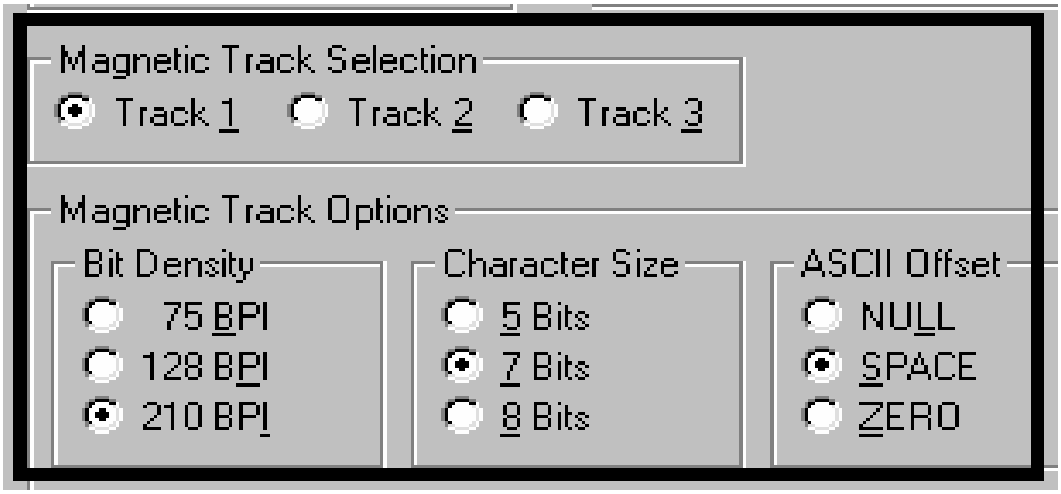
Use this option to customize the Bit Recording Density (Bits per Inch) used to encode the magnetic data on the currently selected track.

Step	Procedure
1	Select 75 BPI to change the bits per inch to 75 BPI. **OR** Select 128 BPI to change the bits per inch to 128 BPI. **OR** Select 210 BPI to change the bits per inch to 210 BPI.

Using the Character Size radio buttons

Use this option to customize the Character Data Size (Bits per Character) used to encode the magnetic data on the currently selected track. (**Note:** This character size includes the parity bit (if enabled).)

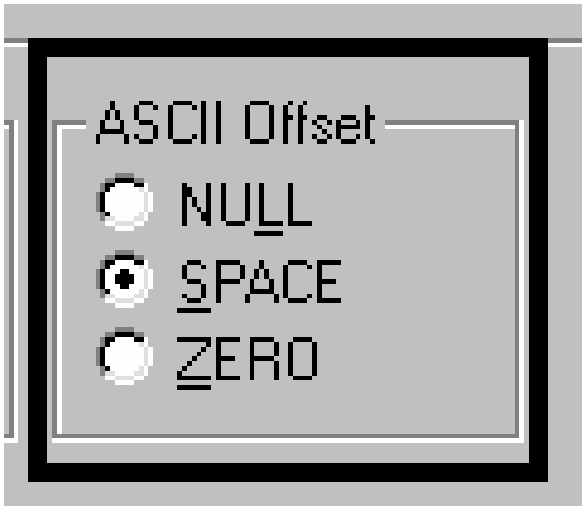
Step	Procedure
1	Select 5 Bits to change the bits per character to 5 BPC. **OR** Select 7 Bits to change the bits per character to 7 BPC. **OR** Select 8 Bits to change the bits per character to 8 BPC.



Using the ASCII Offset radio buttons

Use this option to customize the Character ASCII Offset used to encode the magnetic data on the currently selected track. (**Note:** This character offset value is subtracted from the ASCII value of each Magnetic Stripe data character prior to encoding on the track.)

Step	Procedure
1	Select NULL to change the ASCII Offset to NULL. **OR** Select SPACE to change the ASCII Offset to SPACE. **OR** Select ZERO to change the ASCII Offset to ZERO.



Using the LRC Generation radio buttons

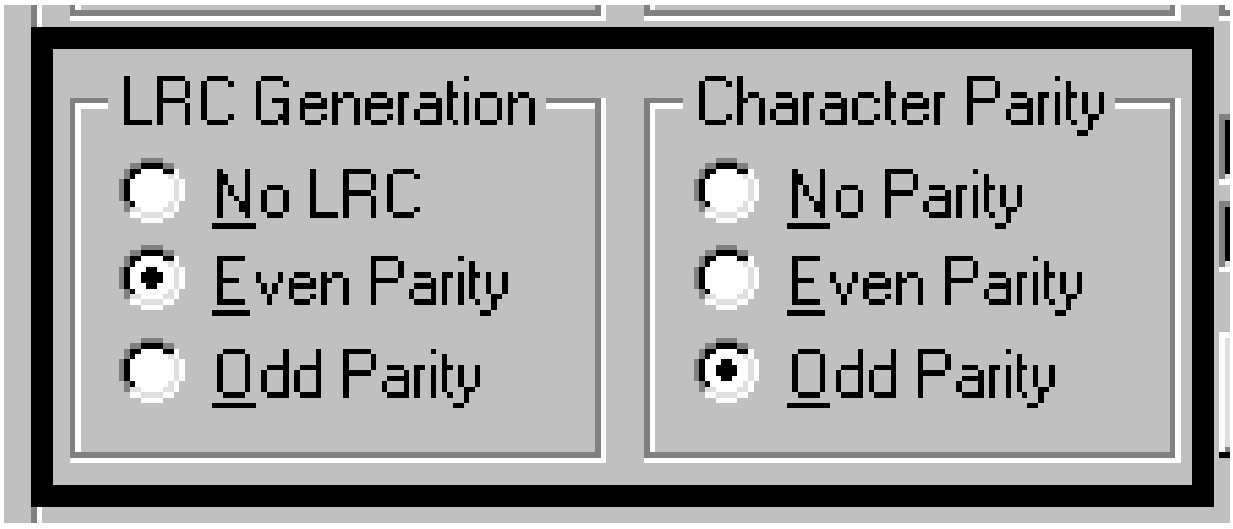
Use this option to customize the LRC Generation Mode (used to encode the magnetic data on the currently selected track).

Step	Procedure
1	Select NO LRC to change the LRC Generation to none. **OR** Select Even Parity to change the LRC Generation to Even Parity. **OR** Select Odd Parity to change the LRC Generation to Odd Parity.

Using the Character Parity radio buttons

Use this option to customize the Character Data Parity (used to encode the magnetic data on the currently selected track).

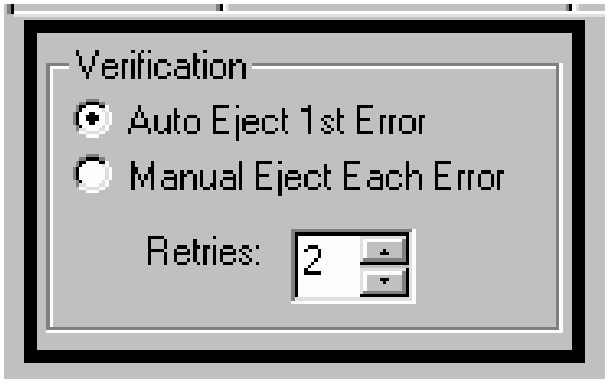
Step	Procedure
1	Select No Parity to change the Character Parity to none. **OR** Select Even Parity to change the Character Parity to Even Parity. **OR** Select Odd Parity to change the Character Parity to Odd Parity



Using the Verification radio buttons and Retries selection

Use this option to customize the encoding verification settings.

Step	Procedure
1	Select the **Auto Eject 1st Error** option to instruct the Printer to verify that all magnetic data has been correctly encoded on each card. (**Note:** The **Auto Eject** option is the most direct means of dealing with misverified cards; however, it may be undesirable when dealing with encoding errors. For this reason, a **Manual Eject Each Error** option is also provided.) • If the **Auto Eject 1st Error** option is selected, the Printer will automatically eject a card containing magnetic data that cannot be verified and will feed a new card into the Printer. (**Note:** Only the first misverified card would be automatically ejected.) • If a second consecutive card cannot be verified, the Printer will signal an error and go into a **Manual Eject Mode**. (**Note:** If the loaded cards have the wrong type of Magnetic Stripe, the Printer will not automatically feed and eject the entire card supply.) **OR** Select the **Manual Eject Each Error** option so that the Printer will signal an error communicating the magnetic data could not be verified. • **Unverified Magnetic Data:** When this occurs, press the **Pause/Resume** button to manually eject the misverified card and feed in a new card. • **Retries selection:** Specify the number of times the Printer must retry its verification pass. (**Note:** A range of 1 to 5 retries can be selected. This option is helpful since successful Magnetic Stripe verification can sometimes require more than a single pass.)



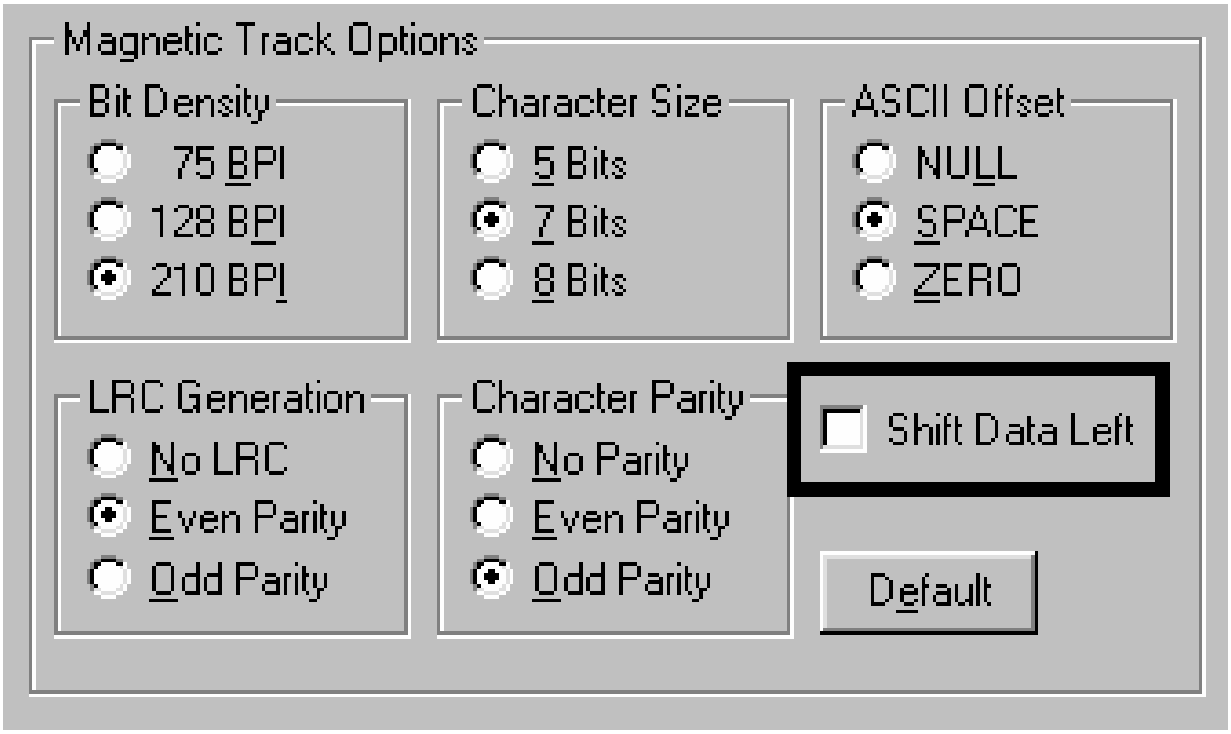
Using the Shift Data Left checkbox

Use this option to shift the recorded magnetic data to the left-hand side of the card's Magnetic Stripe.

OR

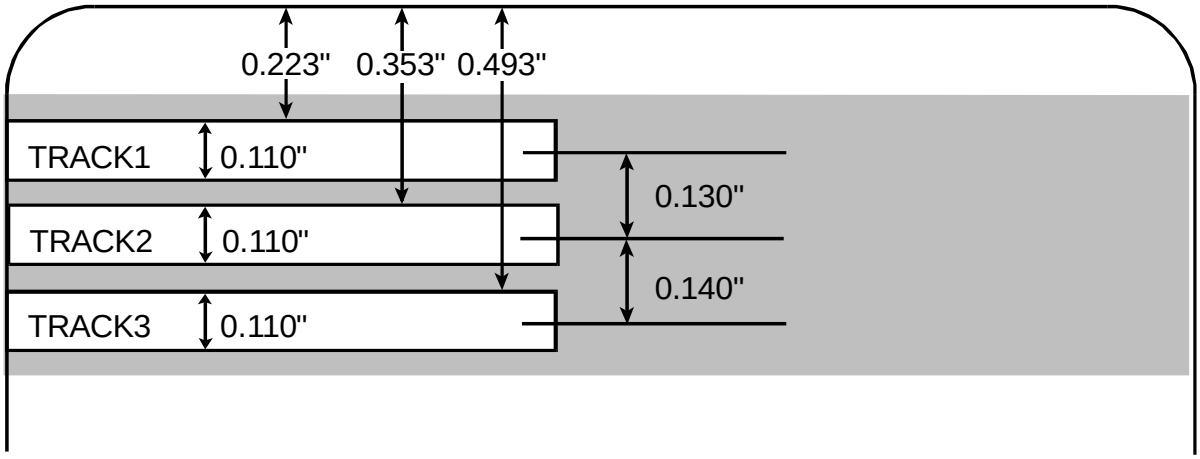
Use this option for situations that require cards to be readable with insert type readers that may be unable to read the right-hand side of the card.

Step	Procedure
1	Select the **Shift Data Left** checkbox option to apply to all tracks.



Reviewing the ISO Track Locations

Review the magnetic encoding module, which encodes onto tracks in accordance with an ISO 7811-2 Magnetic Stripe. (**Note:** Refer to the diagram (below) for track locations.)



Sending the Track Information

Magnetic track data is sent in the form of text strings from the application software to the Printer driver along with all of the other printable objects within the card design.

- **Magnetic Track Data added:** In order for the Printer driver to differentiate between magnetic track data and the rest of the printable objects, the magnetic track data strings must be uniquely tagged or added.
- **Specific Characters added:** In other words, specific characters must be added to the magnetic track data in order for the Printer driver to know which data is to be encoded, which tracks to encode, when the track data stops and starts and so forth.
- **Manually or automatically added:** In some cases, these specific characters are automatically added to the string of track data by customized ID software applications. In most cases, however, the User must manually add these characters to the string of magnetic track data.

Entering the Track Information

(**Note:** If these characters are not added to the track data, the text intended for the magnetic track will most likely appear as printed text on the card.)

Step	Procedure
1	To avoid this symptom, track information must be entered as follows. When entering track data, the "~" character is entered first, followed by the desired track number (1, 2 or 3) used to encode the data. • The data to be encoded should then follow. (**Note:** The first character of this data string must be the track's specific Start Sentinel (SS) and the last character must be the specific End Sentinel (ES).) • The characters or data in between the SS and ES can include all of the valid characters specific to each track. (**Note:** The number of these characters is limited by each track's maximum character capacity.) **Caution:** When segmenting track data, strictly use the appropriate Field Separator (FS).

Reviewing Tracks 1, 2 and 3 (in table format)

Review this table, which displays the SS, ES, FS and the valid characters defined for each track.

	Start Sentinel	End Sentinel	Field Separator	Valid Characters	Maximum Number of Characters
Track 1	%	?	^	ASCII 32-95 (See the table below.)	78
Track 2	;	?	=	ASCII 48-63 (See the table below.)	39
Track 3	;	?	=	ASCII 48-63 (See the table below.)	106

Reviewing the Track Data Note

Review this Note, which displays how track the data should be entered for Tracks 1, 2 and 3:

Track	Data Entry
Sending data to Track 1	**~1%JULIE ANDERSON^623-85-1253?**
Sending data to Track 2	**~2;0123456789?**
Sending data to Track 3	**~3;0123456789?**

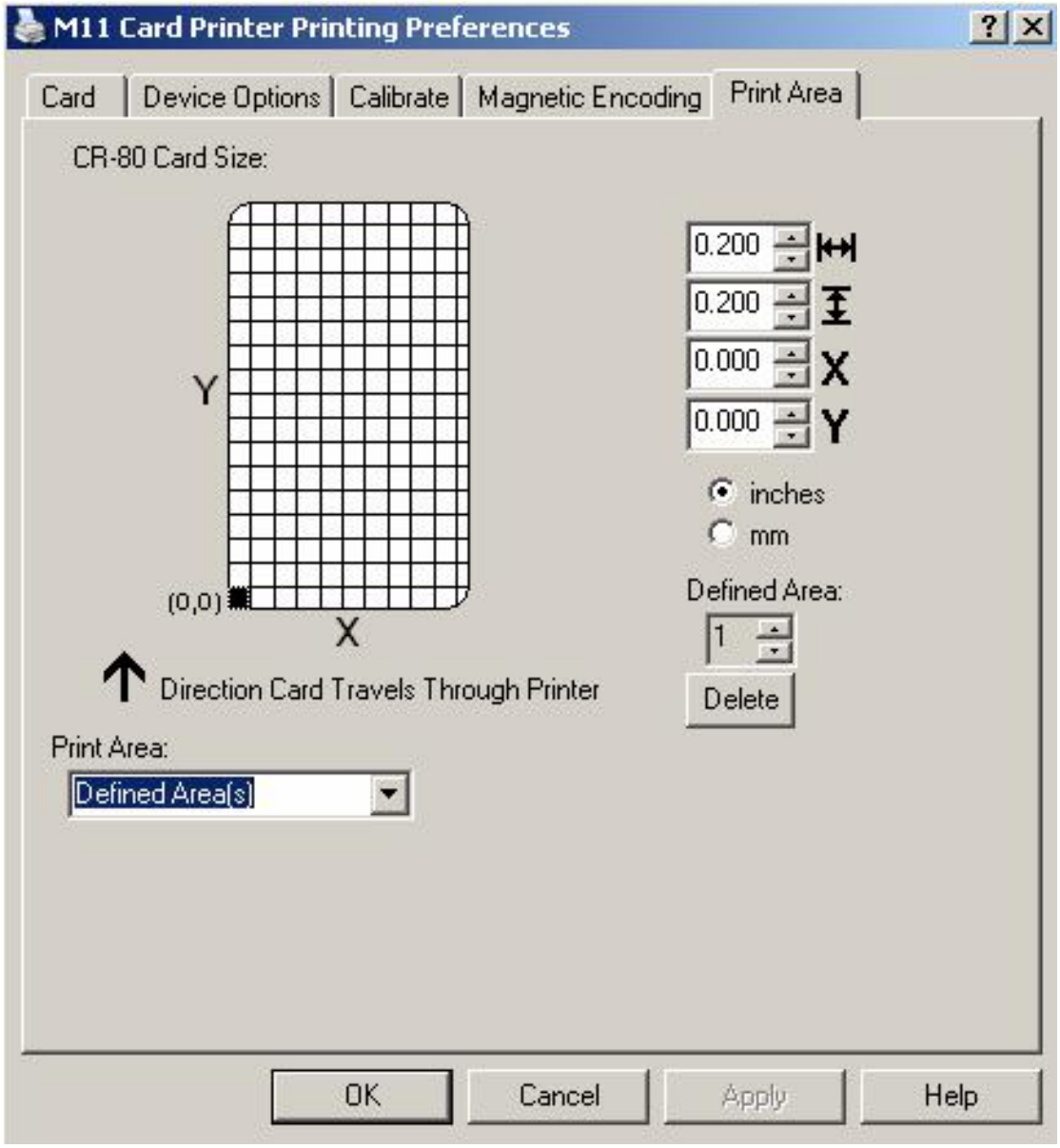
Reviewing the ASCII Code and Character Table

ASCII Code	Character	ASCII Code	Character	ASCII Code	Character
32	space	56	8	80	P
33	!	57	9	81	Q
34	"	58	:	82	R
35	#	59	;	83	S
36	$	60	<	84	T
37	%	61	=	85	U
38	&	62	>	86	V
39	'	63	?	87	W
40	(	64	@	88	X
41	)	65	A	89	Y
42	*	66	B	90	Z
43	+	67	C	91	[
44	'	68	D	92	\
45	-	69	E	93	]
46	.	70	F	94	^
47	/	71	G	95	_
48	0	72	H		
49	1	73	I		
50	2	74	J		
51	3	75	K		
52	4	76	L		
53	5	77	M		
54	6	78	N		
55	7	79	O		

Using the Print Area tab

Use this option to control where the print area appears on a card. (**Note:** This option is helpful if, for example, you would like to omit or block out printing around a card's smart chip or Magnetic Stripe.)

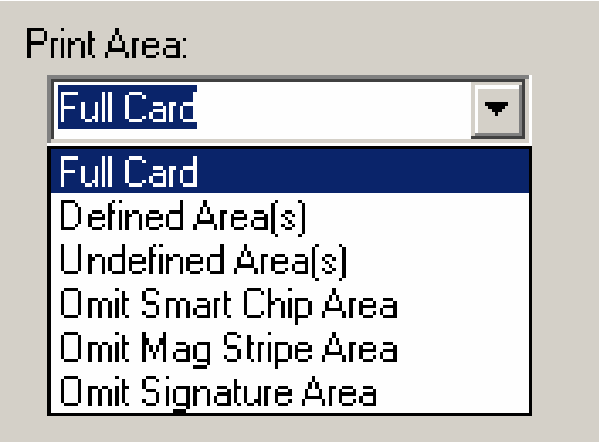
- By default, this option is set to print and overlay the entire card. To customize the overlay and/or print area, select one of the options listed under "Print Area."



Using the Print Area dropdown menu

Step	Procedure
1	Select the **Full Card** option for the Printer to overlay and/or print the entire card. **OR** Select the **Defined Area(s)** option for the Printer to overlay and/or print only in the selected and defined area or areas. **OR** Select the **Undefined Area(s)** option for the Printer to overlay and/or print only in the space outside the selected and defined area. **OR** Select the **Omit Smart Chip Area** option for the Printer to overlay and/or print only in the space outside the standard location of a smart chip. **OR** Select the **Omit Mag Stripe Area** option for the Printer to overlay and/or print only in the space outside the standard location of an ISO Magnetic Stripe. **OR** Select the **Omit Signature Area** option for the Printer to overlay and/or print only in the space outside the standard location of a signature panel. (**Note:** In the card grid, black indicates the area in which the overlay and/or printing will be applied.)

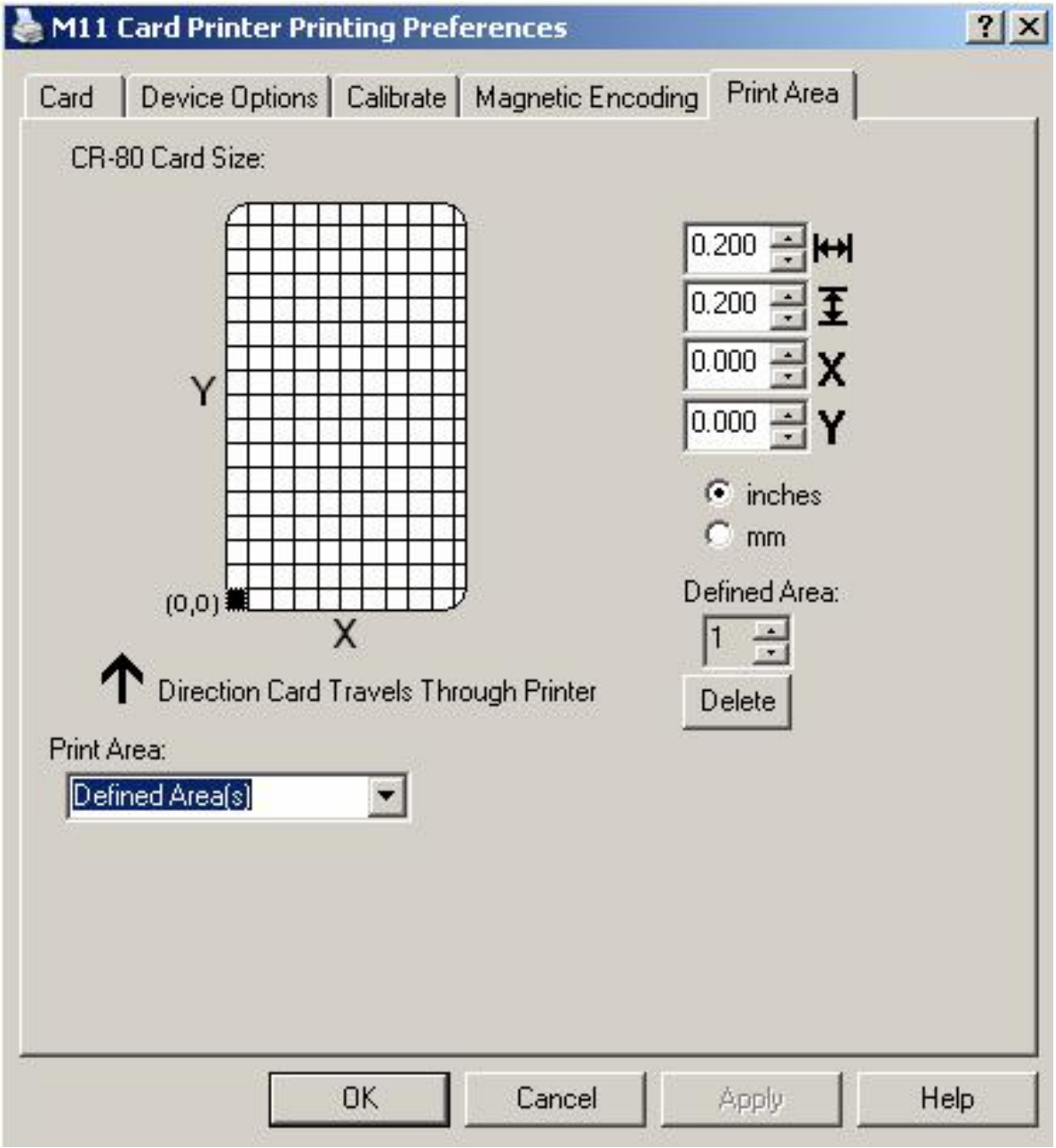
Continued on the next page



Using the Defined Area Option

Step	Procedure
1	Select the **Defined Area(s)** option to activate the card grid in the upper half of the window. It is through this card grid that up to five (5) Defined Areas can be assigned.

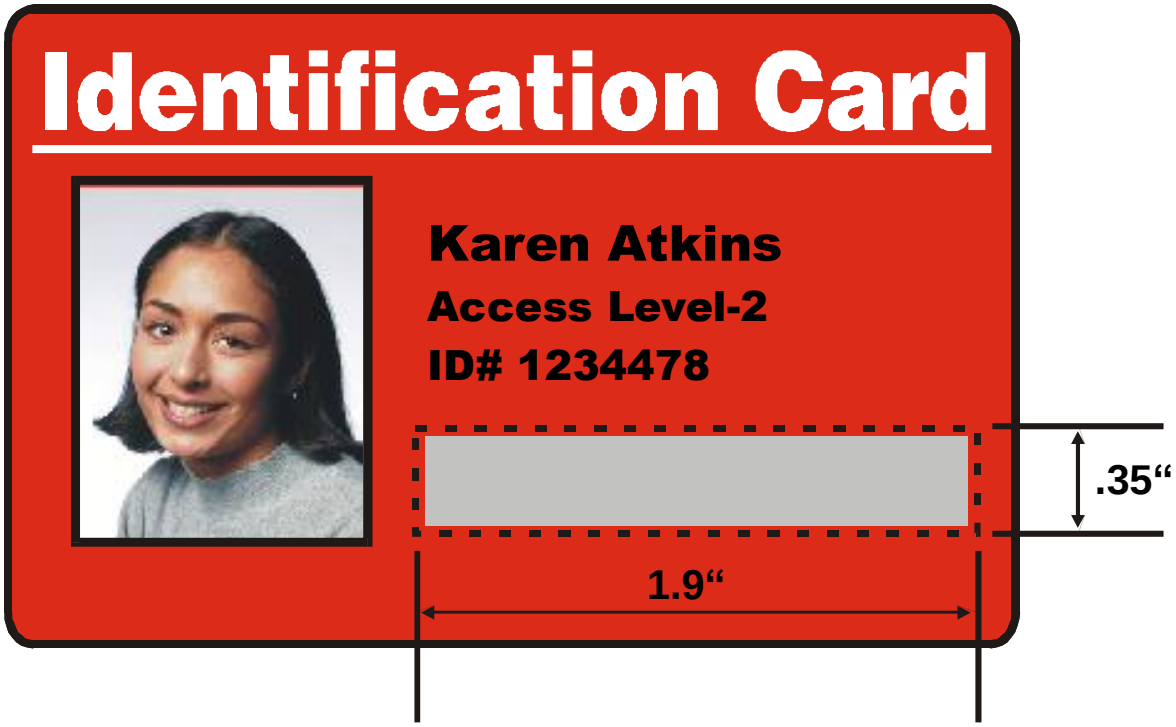
Continued on the next page



Using the Defined Area Option (continued)

Step	Procedure
2	When the card grid is first activated, a small black square will appear at its default size of .2" x .2"/5mm x 5mm and at its default location in the lower left-hand corner (0,0). This square represents the first defined area. • Determine the area of the card needed to define for a signature panel with a different size and location than the driver's standard **Omit Signature Area** setting. (**Note:** This area is indicated by the dashed outline.) • Determine the area size by actually printing a card and looking at it in the same orientation as when it exits the Printer.
3	Measure the total size of the desired area and enter those dimensions into the dimension boxes. (**Note:** The minimum size an area is .2" x .2"/5mm x 5mm.)

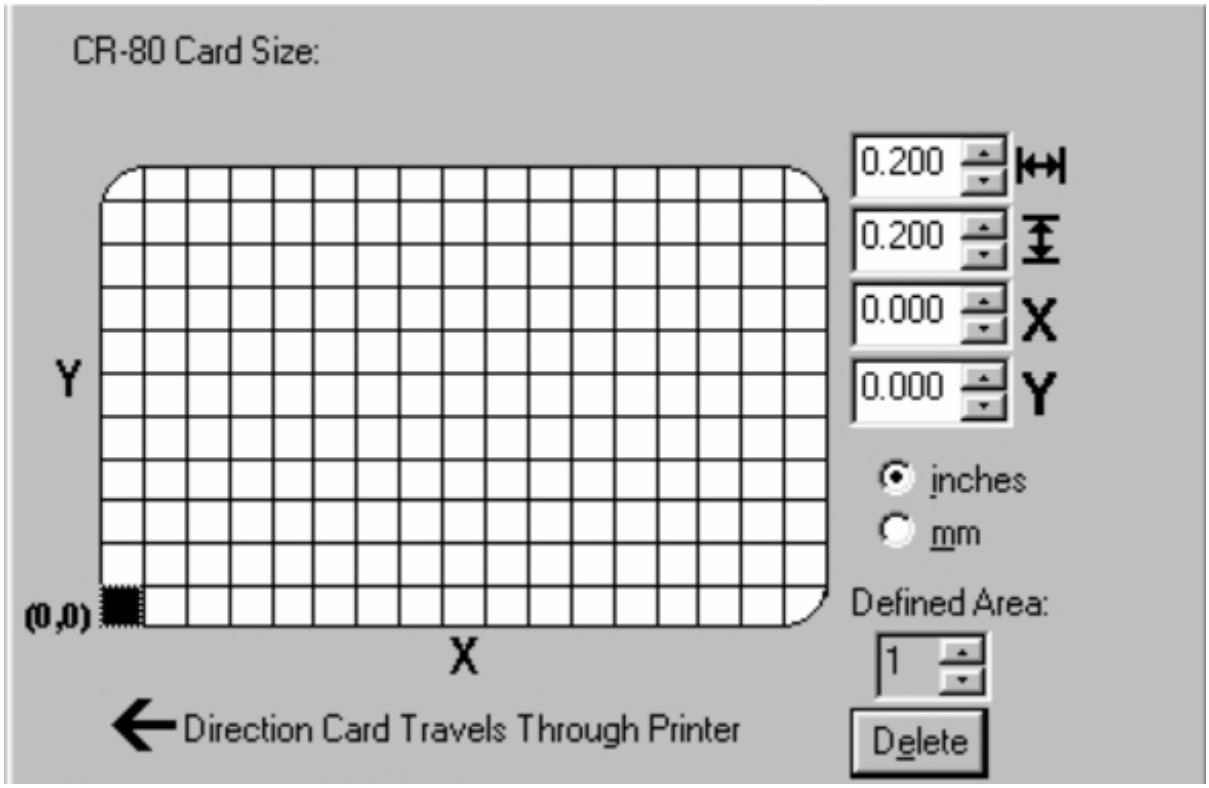
Continued on the next page



Using the Defined Area Option (continued)

Step	Procedure
4	Measure from the lower left corner of the card up and over to the lower left corner of for the defined area to begin and enter these values into the X and Y boxes. (**Note:** The card grid lines are spaced at .2 inch/5mm intervals.)

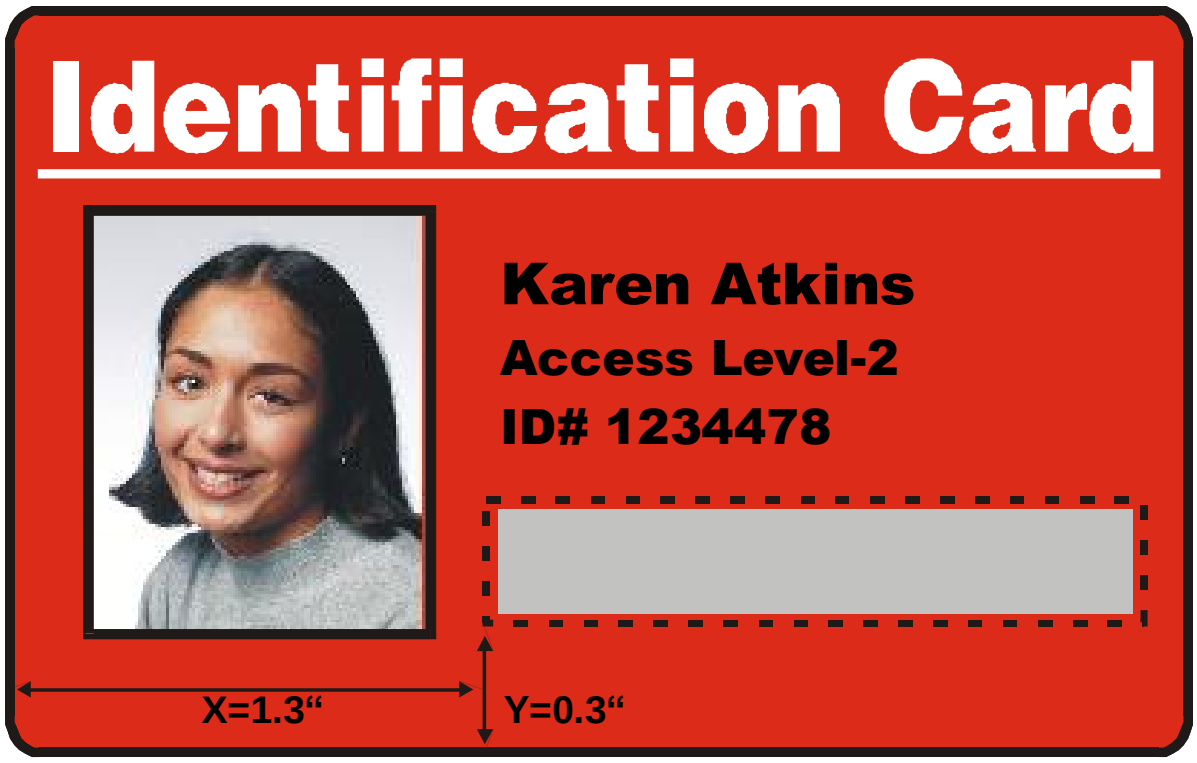
Continued on the next page



Using the Defined Area Option (continued)

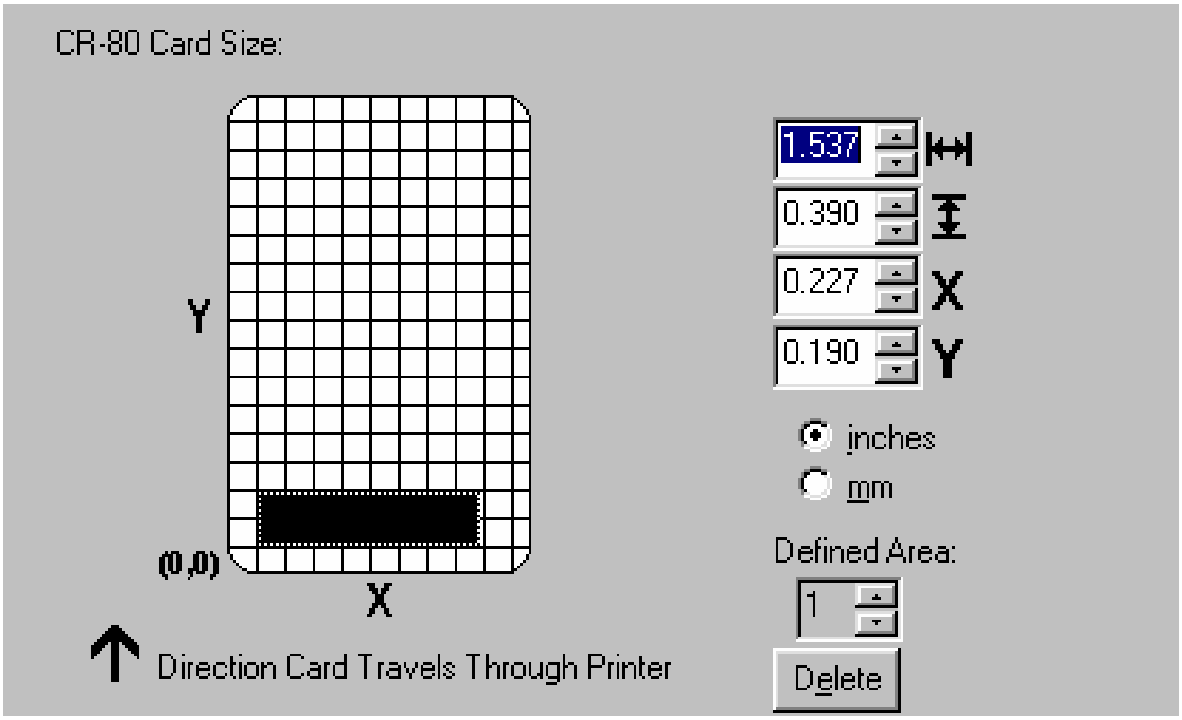
Step	Procedure
5	d. Print the card design and observe how the image is oriented on the card as it ejects from the Printer. (**Note:** The location of a defined area is based on the card orientation as it exits the Printer.) e. Measure the defined area location based on the printed card. (**Note:** If selecting the **Rotate Front 180 Degrees** option, the image will appear upside down as it exits the Printer.) f. Position the defined area opposite to the measurement of the onscreen card design (which will appear right side up).

Continued on the next page



Using the Defined Area Option (continued)

Step	Procedure
6	Use the Defined Area arrows to navigate back and forth from area to area. (**Note:** The active area will always be highlighted with a dotted outline.) c. Define another area by clicking on the Defined Area UP arrow. • Another .2" x .2"/5mm x 5mm area will appear in the lower left-hand corner. (**Note:** This is the location in which all newly defined areas will first appear.) • Up to 5 areas can be defined; however, additional areas cannot be added until the most recently created area has been moved or sized. (**Note:** For this reason, size and position each area as it is created.) d. Delete an area by using the Defined Area arrows to select the area and click on the **Delete** button.



Section 4: Cleaning

The Card Printer is built to require a minimum amount of maintenance. Nevertheless, there are a few procedures you can perform on a regular basis or as needed to ensure the best possible performance

Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger:	**Failure to follow these installation guidelines can result in death or serious injury.** Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair procedures, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these procedures.
Caution:	**This device is electrostatically sensitive**. **It may be damaged if exposed to static electricity discharges.** Information that raises potential electrostatic safety issues is indicated by a warning symbol (as shown to the below). • **To prevent equipment or media damage**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent equipment or media damage**, observe all established Electrostatic Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. • **To prevent equipment or media damage**, always wear an appropriate personal grounding device (e.g., a high quality wrist strap grounded to avoid potential damage). • **To prevent equipment or media damage**, always remove the Ribbon and Cards from the Printer before making any repairs, unless otherwise specified. • **To prevent equipment or media damage**, take jewelry off of fingers and hands, as well as thoroughly clean hands to remove oil and debris before working on the Printer.

Using the Required Supplies

For the maintenance procedures outlined for the Printer, you will need a Printer Cleaning Kit, available from the reseller. This kit includes the following:

- Printhead Cleaning Pens pre-moistened with 99.99% isopropyl alcohol for cleaning the Printer's Printhead.
- Cleaning Cards with an adhesive backing for cleaning the Printer's Card Feed Rollers and Platen Roller.
- Cleaning Pads pre-moistened with 99.99% isopropyl alcohol for cleaning the Printer's general inside and outside area.

Caution: As with any electronic device, internal components of the Printer, such as the Printhead, may be damaged if exposed to static electrical discharges.

- To avoid potential damage, always wear an appropriate personal grounding device, such as a wrist strap (with integral resistor) connected to an ESD ground.
- Or, at a minimum, make positive contact with the bare metal chassis of the Printer with the hand prior to touching any internal electrical components.

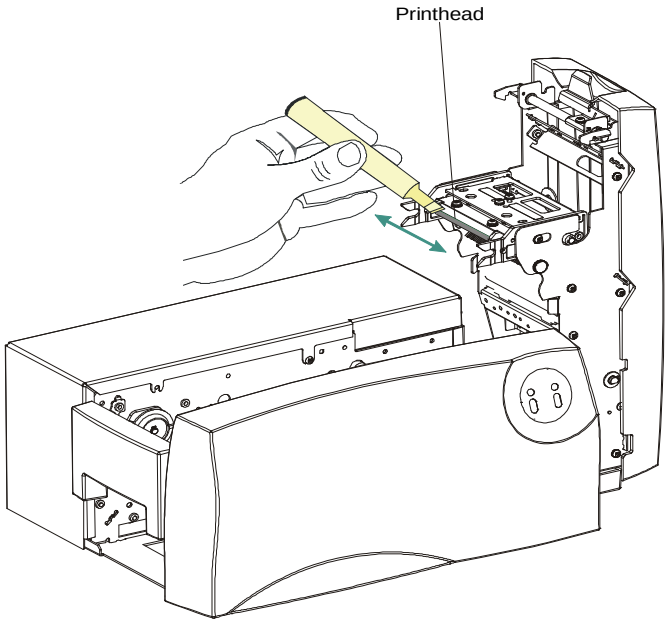
Cleaning Procedures

Cleaning the Printhead

Perform this procedure during every ribbon change or after every **250 prints** to maintain consistent print quality. Also, perform this procedure after noticing a streak on the card where color was not transferred.

Warning: Never use a sharp tool or abrasive object of any kind to clean the Printhead, which can damage it. Watches, rings, bracelets and other jewelry can damage the Printhead if accidentally bumped against it.

Step	Procedure
1	Open the Printer's Top Cover.
2	Using a **Printhead Cleaning Pen** from the Printer Cleaning Kit, firmly wipe back and forth across the surface of the Printhead.
3	Once the Printhead is completely dry, close the Printer. **Caution:** If a streak persists, use an Acetone compound to clean the Printhead.



Cleaning the Card Feed and Cleaning Rollers

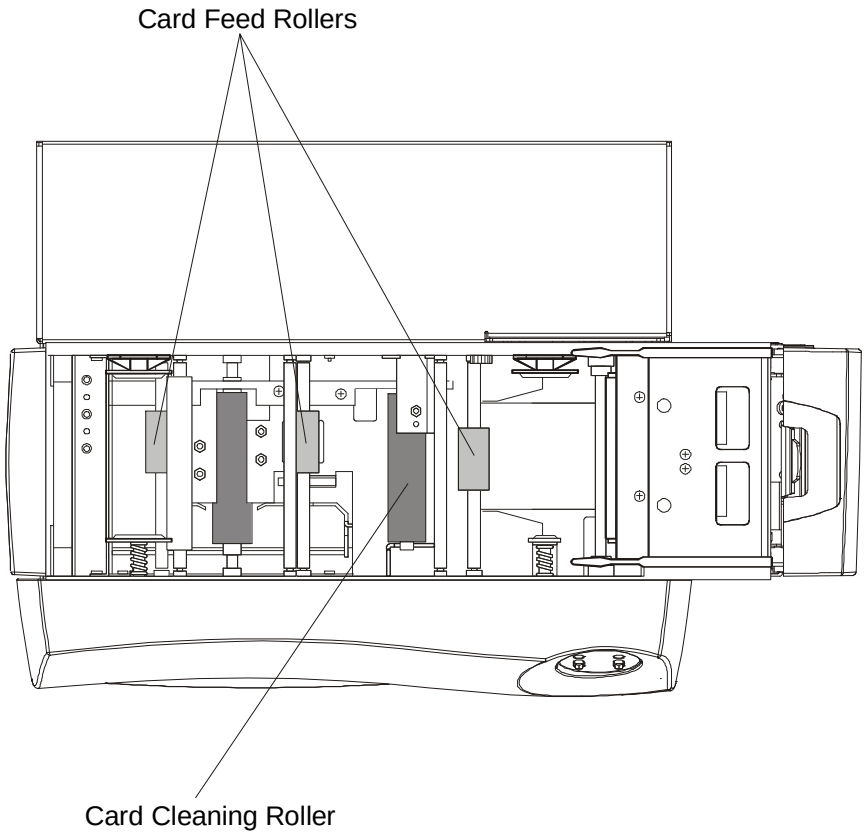
The Card Feed Rollers move the card throughout the print process. The Cleaning Roller removes dust particles from a blank card as it feeds into the Printer. Cleaning these rollers will help prevent card jams and card contamination and will ultimately lead to better print quality and extended Printhead life.

Step	Procedure
1	Ensure a consistent Printer operation by cleaning these rollers approximately every **250 prints** or during every ribbon change, depending on the cleanliness of the card stock and the environment (in which the Printer is located). Clean the rollers if the rollers appear dirty or if the cards start showing speckles or debris on the printed surface by following Steps 2 to 7 (below).
2	Leave the Printer power ON and open the Printer's Top Cover.
3	Remove all cards from the Printer's Card Input Hopper.
4	Get a Cleaning Card from the Printer Cleaning Kit and remove its adhesive backing paper.
5	Insert the Cleaning Card into the card output end of the Printer until the card stops. (**Caution:** Be sure to insert the card so that the longest end of the card is inserted first with the sticky side facing up.)

Continued on the next page

Cleaning the Card Feed and Cleaning Rollers (continued)

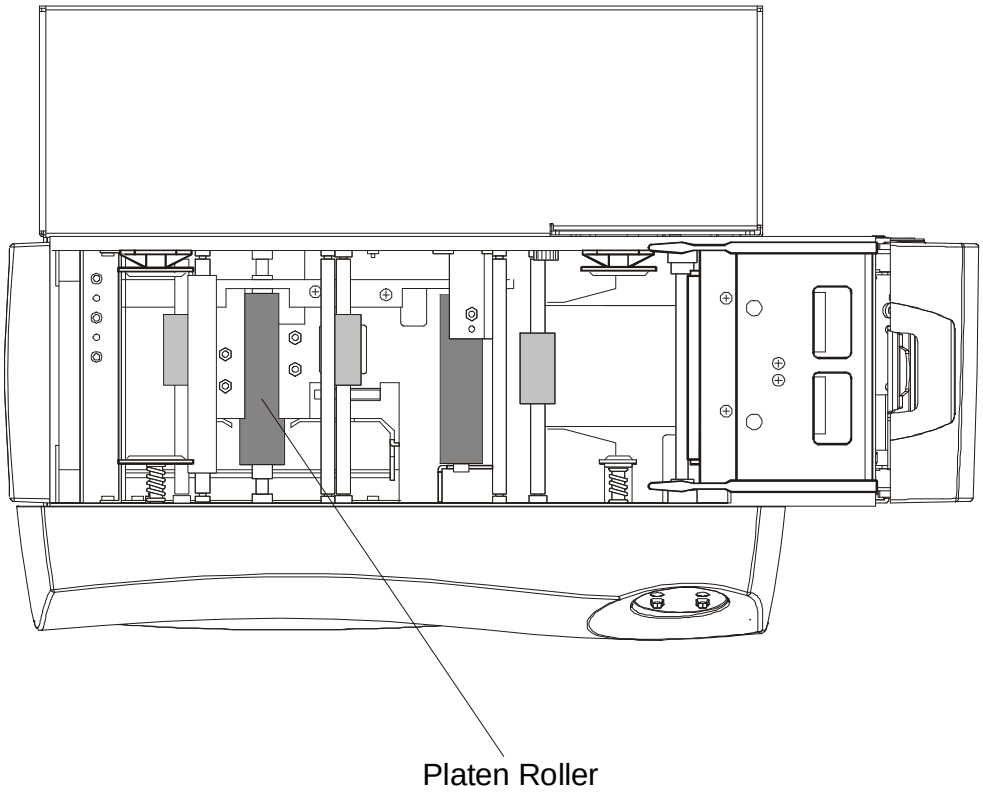
Step	Procedure
6	Press and hold the Printer's Media button to feed the Cleaning Card all the way back through the Printer until it stops.
7	a. Close the Printer's Top Cover and pull the Cleaning Card out of the Card Input Hopper. b. Repeat this cleaning procedure if additional cleaning is necessary. c. Once the rollers are clean, close the Top Cover and re-insert cards into the input Hopper.
8	If the Cleaning Roller needs additional cleaning, simply remove it from the Printer and manually roll it back and forth across the sticky portion of the Cleaning Card.



Cleaning the Platen Roller

Clean the Printer's Platen Roller approximately every **250 prints** or during every ribbon change. This helps prevent jams and maintain the best print quality. Also, perform this procedure if the roller is visibly dirty. Use the following steps to clean the roller:

Step	Procedure
1	Leave the power ON and open the Printer's Top Cover.
2	Remove the print ribbon.
3	Locate the Platen Roller.
4	Use a **Cleaning Pad** from the Printer Cleaning Kit to wipe the roller clean. Press the Power button ⏻ and Media button to move the roller back and forth while cleaning.
5	After the roller is clean and completely dry, replace the printing supplies and close the Printer.



Cleaning the Printer's Exterior

The Printer has a durable casing that should retain its luster and appearance for many years. Clean it only with a **Cleaning Pad** from the Printer Cleaning Kit. DO NOT use cleaning solvents of any kind or spray the cabinet with a cleaner!

Cleaning the Printer's Interior

Dust and other particles may accumulate inside the Printer with continued usage. These particles are attracted to the print ribbon or blank card by static produced during printing and can contaminate the printed card causing spots or speckles to appear. Periodically, use the following procedure to remove dust and other contaminants:

Step	Procedure
1	Open the Printer's Top Cover.
2	Remove the print ribbon from the Printer.
3	Use a **Cleaning Pad** from the Printer Cleaning Kit to wipe out all visible areas inside the Printer. Remove any debris that may be inside. Be extremely careful not to let any alcohol drip inside the Printer!
4	Re-install the printing supplies and close the Printer.

Section 5: Packing the Card Printer

The purpose of this section to provide the User with a specific packing procedure for this Card Printer.

Follow this instruction to pack the Card Printer for transport.

Step	Procedure
1	Clean the inside of the Printer with deionized air.
2	Wipe it down with a lint-free cloth.
3	Clean the Printhead with a Printhead pen.
4	Pack the Printer in the original carton and packing materials.
5	Be sure to enclose any necessary paperwork, test cards, etc.

Section 6: Board Level Diagnostics

The purpose of this section to provide the User with specific Board Level Diagnostic procedures for Board Errors and Sensor Testing for this Card Printer.

Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger:	**Failure to follow these installation guidelines can result in death or serious injury.** Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair procedures, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these procedures.
Caution:	**This device is electrostatically sensitive**. **It may be damaged if exposed to static electricity discharges.** Information that raises potential electrostatic safety issues is indicated by a warning symbol (as shown to the below). • **To prevent equipment or media damage**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent equipment or media damage**, observe all established Electrostatic Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. • **To prevent equipment or media damage**, always wear an appropriate personal grounding device (e.g., a high quality wrist strap grounded to avoid potential damage). • **To prevent equipment or media damage**, always remove the Ribbon and Cards from the Printer before making any repairs, unless otherwise specified. • **To prevent equipment or media damage**, take jewelry off of fingers and hands, as well as thoroughly clean hands to remove oil and debris before working on the Printer.

Sensor Testing

Step	Procedure
1	Check the voltage to determine if a Sensor is working.
2	a. Test the voltage of each Sensor using ground (GRD = Chassis) unless noted to the correct pin on each connector. See **Sensor Location and Voltages** table on the next page. b. Block a Slot Sensor with a card. c. Depress a switch style Sensor.

Reviewing the Sensor Location and Voltages

Use this table as a reference tool for Board Level Diagnostics

Sensor	Location	Pin	Low Range VDC	High Range VDC
Print Ribbon ID	J10	3	Present .02	Not Present .70
Headlift	J6	1, 3 (+, -)	Not Depressed 0 - .17	Depressed 4.9 – 5.5
Print Cover Sensor	J4	1, 2 (+, -)	Not Depressed 0 - .17	Depressed 4.9 – 5.5
Print Ribbon Encoder Sensor	J11	3,4 (+, -)	Unblocked 0 -.17	Blocked 4.9 – 5.5
Card Detection Sensor	J8	4	Unblocked 0 -.17	Blocked 4.9 – 5.5

Reviewing the Motor Voltages (when active)

Use this table as a reference tool for Board Level Diagnostics

Motor	Location	Pin	VDC
Print Drive Stepper	J25	4	4
Print Headlift	J15	1	17.0
Ribbon Drive	J14	1	5

Section 7: Firmware Upgrades

The purpose of this Technical Update (dated 04/27/2003) to provide information on a Firmware improvement to the Persona® C11 Card Printer and Persona® M11 Card Printer. The ECO C04008 has been released. No action is required. This is for your information only.

- **Firmware Improvement (C11/M11):** The ribbon-queuing improvement makes the ribbon handling more robust to ensure the maximum number of prints from our color ribbons.

Section 8: Fargo Technical Support

The purpose of this section to provide the User with an efficient, step-by-step procedure to be used when contacting Fargo Technical Support as needed for this Card Printer.

Contacting Fargo Technical Support

Step	Procedure
1	Read the suggested Sections of the Technical Service and Maintenance Manual in order to troubleshoot a C11 Card Printer. As needed, contact the Fargo Technical Support Group by phone at (952) 941-0050 or by fax at (952) 941-1852 for additional, technical assistance. **OR** Contact Fargo Technical Support via the Web: http://www.fargo.com/tech_support/contact_tech_support.asp
2	Position a phone near the Printer and Computer so Fargo technicians can help to help troubleshoot the Printer(s).
3	Please have a self-test and a sample card ready when calling Fargo Technical Support.

Reading the Serial Numbers on a Fargo printer

The purpose of this section is to provide updated instructions for reading serial numbers on a Fargo printer.

Finding out when a Fargo Card Printer was manufactured

You can determine when your card printer was manufactured by reading directly from the serial number (affixed to your card printer).

1. **Year Built:** The first two digits in the serial number indicate the year that the printer was manufactured.
2. **Week Built:** The second two digits indicate the week.
3. **Numeric Order:** The last four digits indicate the sequence number for the numeric order in which the printers were built.

Reviewing Example No. 1: Serial Number 80453289

1. **80453289:** The first two digits in the serial number indicate the year the printer was built (e.g., the digits 80 indicate the year 1998).
2. **80453289:** The third and fourth digits in the serial number indicate the week the printer was built (e.g., the digits 45 indicate week 45 of that year).
3. **80453289:** The last four digits indicate the sequence number for the numeric order in which the printers were built.

Reviewing Example No. 2: Serial Number A1280224

1. **A1280224:** The first two digits in the serial number indicate the year the printer was built (e.g., the letter and digit A1 indicate the year 2001).
2. **A1280224:** The third and fourth digits in the serial number indicate the week the printer was built (e.g., the digits 28 indicate week 28 of that year).
3. **A1280224:** The last four digits indicate the sequence number for the numeric order in which the printers were built.

Section 9: Reviewing the Spare Parts List

Persona C11/M11 ID Card Printer
Recommended Spare Parts List
Effective Date: April 2004
For current pricing see http://www.fargopartner.com/support_services/

Glossary of Terms

Term	Definition
24-bit color	A color depth for an image that uses 8 bits for each color (red, blue, green) combining the possible 256 shades to provide a color depth of 16.7 million colors.
AC - Alternating Current	An electrical current that reverses its direction at regular intervals (typically 50 - 60 times a second).
Access Card	The card for the SmartGuard security system. A cared with embedded electronics that can be removed from the Printer, locking the Printer and preventing unauthorized use.
Adhesion	The firm attachment of a material to the card surface, confirmed by using the Tape Test -pulling an applied piece of adhesive tape (Scotch 600 or equivelent) off the card at 1 sec/in to see if any material is pulled off by the tape.
Algebraic	A type of color matching that takes the colors value of pixels and applies them to an algebraic equation to adjust the levels of hue, saturation and brightness.
ANSI (American National Standards Institute)	The United States Representative to ISO, providing standardization for U.S. Manufactures prior or in addition, to acceptance by ISO.
AS400	An IBM operating system running on a main frame. DTC500 Fargo Printers are built with fonts saved in the Printer memory so users of AS400 can write escape codes and print from the Printer.
ASCII (American Standard Code for Information Interchange)	A standard for processing information in computer processors. An 8-bit character set of 255 decimal numbers, each assigned to numbers, letters, punctuation and special characters.
AT	Refers to an IBM standard in early computing with regard to the chipset and function of the parallel port, set up in the BIOS.
B (Black)	Black Dye-Sublimation panels are distinguished from the black panel using resin by the use of B for dye sub black. K denotes resin black.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Barcodes	A series of alternating black and white stripes, of varying widths (each character denoted by a set number and width of black stripes) that allows characters to be optically read by a computer.
Batch print	A file sent down from the computer that contains commands to print a number of cards, sequentially.
Battery Back-up	A power supply that can keep AC electronic equipment running for a short time when power is interrupted, allowing enough time for the user to save data and close the machine properly.
Bi-directional	A communication standard that allows two way data transfer between PC and Printer.
BIOS (Basic Input/Output System)	The part of the operating system in a computer that handles communication between the PC mainboard and its peripherals. Typically residing in chip-based, non-volatile memory.
Bit	An abbreviation for binary digital. Each bit is an element of information that can have two states: off and on.
Bit map	A graphic produced by an array of pixel elements with the color hue, brightness and saturation information stored in bits. The more bits, the more values and thus the greater variety. 1 bit color is black and white, 8-bit color produces 256 shades of gray and 24-bit color can produce 16.7 million colors.
Board	A term used for the circuit board, a hard mylar plate made of many layers, that holds the electronic circuit elements and wire traces.
Boot-up	A series of operations that the Printer runs through when power is first applied including a series of initializing, status testing and a diagnostics program to ensure a ready state.
Buffer	A block of memory, in the Printer or PC, that holds print files until the processor is ready to print them.
Cable	A set of conductors wrapped together and often concealed within insulation, used for signal transfer from one device to another, with connectors on either end that allows the cable to be removed.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Cache	A type of memory buffer to store data temporarily, used to hold information that is most often exchanged between controller and peripheral, to expedite data transfer.
Calibrating	A procedure to adjust an electro-mechanical device so that it operates within established parameters.
Cleaning Roller	High tack rollers positioned just after the input Hopper to lift debris off the card as it rolls over it. A clean card surface improves print quality.
CD (Compact Disc)	A 4.75 inch (12 cm) optical disk that stores data, written too and read from using a laser.
DMA (Direct Memory Access)	Channels designated within the Windows operating environment that are used for dedicated high-speed communication between the PC and the Printer port.
Centronics	A parallel communications interface that has become the standard for connections to Printers, designed by the Centronics Corp.
Coercivity	The property of a Magnetic Stripe that indicates the amount of force needed before magnetic saturation, measured in Oersted (Oe).
Color matching	The process of adjusting color hue, saturation and brightness, to duplicate a desired color. An algorithm within the driver, which adjusts the color balance and provides output with the desired color, automates this process.
Compressed air	Air stored in a tank or produced by an aerosol can, delivered by through nozzle at a high speed. Used in the Printer to blow out debris.
Contrast	The degree of difference in luminance of two areas.
Control panel	The panel on the Printer from which the user can control Printer functions. The Printer is usually composed of the control buttons and an LED or LCD display.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
CR-79	A card dimension standard of 2.0625" L X 3.3125" W (+/-0.002" W, +/-0.005" L) or 52.400 X 84.150 mm.
CR-80	A card dimension standard of 2.125" X 3.370" (+/-0.002" W, +/-0.005" L) or 53.975 X 85.598 mm.
CR-90	A card dimension standard of 2.375" X 3.625" (+/-0.002" W, +/-0.005" L) or 60.325 X 92.075 mm.
CR-100	A card dimension standard of 2.625" X 3.875" (+/-0.002" W, +/-0.005" L) or 66.675 X 98.425 mm.
Cursor	The marker in the LCD Display Window that indicates the active selection.
Darkness	A reference to color saturation.
DB-9	A 9 pin, D-shaped connector, typically used in serial port interfaces.
DC Motor	A Motor that works on DC with continuous motion.
DC (Direct Current)	Electronic flow that is unidirectional, flowing from the positive (+) to negative (-) of a power source.
Default	A setting or parameter that comes preset from the factory in driver or firmware. Performance parameters may be customized in the driver, but can be reset to the factory values usually through the push of the default button. The default values for the firmware are usually denoted on a label attached to the Printer.
Defrag	Abbreviation for defragmenting. The process of reformatting data on a hard drive so that it uses space more efficiently.
DIP switches (Dual In-line Package Switches)	A small array of mechanical switches installed on the board that can be configured to change Printer operations including providing a variety of self-tests.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Direct-to-Card (DTC) Printing	The Direct-to-Card printing process prints digital images directly onto any plastic card with a smooth, clean, glossy PVC surface.
Dither	A system of distributing dots to control the hue, brightness and/or saturation. In monochrome printing, this controls the brightness. In color printing, dithering can supply a larger color gamut than non-dithering. In the driver, dither modes can be selected to provide better image quality depending on the type of image to be printed.
Dongle	A peripheral that attaches to a port to act as a key for an installed application. The PC is able to run that application only when the dongle is installed. Typically, it works as a pass-through device and is connected in serial to the parallel cable.
Dot	The smallest unit of an image that the Printer is able to produce. The smaller the dot, see dot pitch, the sharper the image.
Dot pitch	A measurement of image sharpness denoting the width of the dots that make up a pixel. The smaller the pitch, the sharper the image.
Download	The transfer of a data file from one device to the other over a network or cable, typically from the Internet to a PC.
DPI (Dot Per Inch)	A measurement of the Printer resolution indicating how many dots a Printer can produce in a linear inch.
DRAM (Dynamic Random Access Memory)	A microchip based volatile memory storage device. The Printer uses this to buffer a print job, transferred from the PC, until the Printer controller is able to process the packet.
Driver	Software utility installed in Windows, that interfaces an application to rasterize image data and include command codes so the Printer can process the file.
Duplex Printing	Printing on the front and the back of the card.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Dwell Time	The speed at which the card moves across the lam roller, measured in seconds/inch (secs/in). This may be adjusted in the driver to ensure adhesion and card flatness.
Dye Migration	The diffusion of dye out of the card surface and into another receptive surface, such as a vinyl pouch card holder, resulting in a faded image.
Dye-Sublimation	Also called dye diffusion/thermal transfer, it is the process of heating a dye suspended in a cellulous substrate until the dye can flow, diffusing into the dye receptive surface of the card or InTM. This produces the image in the surface of the card.
E-card	An abbreviation for electronic card. A generic term used to reference any card with built-in electronic devices such as smart cards or prox cards.
E-card Docking Station	The device in the Printer that accepts smart cards with an ISO smart card contact station. This allows the user to write to the smart card chip with a standard RS-232 interface in the back of the Printer or with the optional built-in encoder.
Edge-to-Edge	Refers to the maximum printable area on a card resulting in printed cards with virtually no border.
ECP Mode (Enhanced Capabilities Port Mode)	A type of parallel port mode, developed by Microsoft, to increase the port throughput and improve performance.
EE Memory	An abbreviation for EEPROM.
EEPROM (Electrically Erasable Programmable Read Only Memory)	A microchip based non-volatile memory storage device that can be rewritten in the field. The chip can hold new values as the Printer adapts its operational parameters.
Encoder (smart card)	An electro-mechanical interface to transfer data from the PC to a chip or Magnetic Stripe built into the card.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Encoder (wheel)	An electromechanical device, attached to a shaft that detects the change in rotational position, incremented to count ticks per revolution. The Printer's encoder wheel both detects motion and measures the amount of rotation in the movement of the ribbon.
Engine	A generic term for a collection of systems and mechanisms that is dedicated to executing a specific function. A Printer that also laminates would have both a print engine and a lamination engine.
EOF (End Of Form)	The trailing edge of the card, detected to indicate when the Printer should stop printing.
EPP (Enhanced Parallel Port)	A type of parallel port mode, developed by Intel, to increase the port throughput.
EPROM (Electronically Programmable Read Only Memory)	A microchip based non-volatile memory storage device that cannot be rewritten in the field. Firmware for many Fargo Printers is stored on these chips and so a change of the chip is necessary for an upgrade.
Escape sequence	A string or control character that indicates to the processor that what follows is a command and not data.
ESD (ElectroStatic Discharge)	The discharge of static electricity (high voltage, low current) that can damage electronic devices.
Ethernet	A system of networking a series of computers for the sharing of data or peripherals.
Film	A thin flexible transparent sheet used to carry dye-impregnated material or resin to be transferred to the card.
Firmware	The instruction set, stored in chip memory, inside the Printer that controls functional and operational data. Some models require a chip change for updates; some firmware can be changed by reprogramming from the PC.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Flash Memory	A microchip based non-volatile memory device that holds its data when power is removed. This allows for field reprogramming of the Printer commands, such as Printer firmware upgrades, without the necessity of changing chips.
Font	A character set similar in style and form. Fonts can be graphical or mathematical constructs, represented by a series of dots or an assembly of curves and lines.
FPGA (Field Programmable Gate Array)	A microchip with configurable logic circuits installed that is programmed to act as the Printer's central processor.
Full bleed	Printing that covers the entire card surface.
Gamma	The degree of contrast of an image or the display of a monitor determined by the slope of a characteristic curve relating optical density to relative log exposure.
Glossy/Matte	A smooth polished surface in comparison to a rougher matte surface. Fargo matte cards have a surface index (Ra) of approximately 65 microinches while glossy have a Ra = 3.
Glossy PVC	A card made of PVC with a smooth polished surface (Surface roughness of approximately 0 - 10 micro-inches). This is required for direct to card dye-sublimation printing.
Graphical Device Interface (GDI)	A Windows standard for protocol between drivers and applications and the Windows interface. An application uses a driver to rasterize the data in the format necessary for the Printer but also for the Windows interface to execute the print commands.
Gray Scale	A graduation through the various brightness levels from white to black.
Halftoning	A process in monochrome printing that simulates continuous tone by using changes to the distribution of single dots. Increasing the number of dots in a given area increases the darkness even though the individual dots stay the same size.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Hard Drive	A high capacity storage device in a PC consisting of non-removable magnetically encodable platters.
Hardware	Physical components of a system such as the Printer, the PC, the power supply.
HDP (High Definition Printing™)	The High-Definition Printing process prints full-color images onto clear HDP transfer film (InTM). The HDP film is then fused to the card through heat and pressure via a heated roller. The printhead is capable of 256 shades with a sharper print and better color match.
Head	Abbreviation for printhead.
Heat sink	A device used to dissipate heat into the ambient.
Heat Seal	A resinous film transferred by the printhead onto the back of an HDP intermediate transfer film to facilitate adhesion.
HiCo (High Coercivity)	The coercivity value of magnetic media between 2500 - 4000 Oe (ISO 7811-6). Fargo's High Coercivity encodes at 2750 Oe.
HTML (HyperText Markup Language)	A standard protocol used to format text files for use in a browser or on the Internet.
HTTP (HyperText Transfer Protocol)	A standard protocol by which computers can transfer data, compatible through multiple platforms.
IC (Integrated Circuit)	An electronic device that contains many individual circuits interconnected and placed within a discrete package.
ID (Identification)	An abbreviation for identification.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
IEEE 1284 (Institute of Electrical and Electronics Engineers 1284)	A standard method of signaling for a bi-directional parallel interface on personal computers. To ensure proper Printer communications and image output, Fargo recommends a parallel interface cable that complies with this specification.
Image	A collection of pictures or graphical elements that compose the visual features on a card. Also refers to the digital representation.
Input	Any data or material being transferred to the Printer.
Input Hopper	The area of the Printer that stores the blank cards, ready to print.
Intermediate Transfer Media (InTM)	A thin flexible material coated with a resin material into which the dye is transferred from the ribbon by the printhead. The film is then transferred to the card surface by the hot lamination roller.
ISO	For the Greek, "iso", meaning same. Used to represent data from the International Organization for Standardization.
JIS II (Japanese Industrial Standard)	The standard for encoding to a Magnetic Stripe provided by the Japan Standards Association. The single track is as wide as ISO tracks 1 and 2 combined and in the same approximate location as those tracks but on the front of the card. The coercivity level is 600 Oe.
K Panel	An area of a multicolored ribbon (e.g., YMCK) that contains black resin for transfer to the card surface. Also used in reference to the application of preference to items printed on the card - those using the black panel in lieu of a process (YMC) black.
Lamination	The application of a film or resinous substance, fused by heat and pressure, to the surface of a card.
LAN (Local Area Network)	An array of several computers connected through a series of data transfer cables for the sharing of data and peripherals.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Landscape	A document layout that is viewed with the document's long axis in a horizontal orientation.
LCD (Liquid Crystal Display)	A device that contains a liquid crystal between two pieces of polarized film through which reflected or ambient light can pass. When a current is applied, the liquid's polarity changes and blocks the passage of the light resulting in an opaque area of the display. The areas are arrayed to form characters.
LED (Light Emitting Diode)	A semiconductor that emits light when a current is applied.
Media	A generic reference to anything onto which the Printer can transfer an image including cards, ribbon and film.
LoCo (Low Coercivity)	The coercivity value of magnetic media between 250 - 600 Oe (ISO 7811-2). Fargo's Low Coercivity encodes at 300 Oe.
LPT Port (Line Printer Port)	The system abbreviation for a PC's parallel Printer port.
Mag encoding	The process of orienting successive magnetic bits to produce a serial data string.
Mag stripe	An area of the card with an applied or impregnated ferrous material that may hold encoded data through a series of prescribed polarity changes.
Mag Track	An area of a magnetic strip running the length of the card, with a given width and position, constitutes a track. This is the area dedicated to one data string, restricted to specific rules of format. ISO Standards specify three magnetic tracks on the back of a card. The JIS standard specifies one track on the front.
Mag Verify	A process to confirm proper magnetic encoding. After encoding, the information is read off back and compared to the intended string.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
MB (Megabyte)	A unit of storage that equals 1,048,576 bytes.
Memory	A generic term for any device that stores digital information using magnetic media or digital chip storage device.
Menu	A descriptive list of headings above nested functions that aid navigation to a specific operation. These are found in computer applications, with the heading at the top of a subset of like functions. They are also on the Printer LCD control panel.
Monochrome	An image composed of a single color.
Network	A series of computers connected by data transfer cable for communication and sharing of functions and peripherals.
Oersted (Oe)	The unit of magnetic field strength named after Dutch scientist Hans Christian Oersted who found the science of electromagnetism.
Offset	The prescribed distance between a reference point and the target point. The offset in card printing may refer to the position of the image relative to the leading edge or the distance of the start of magnetic encoding from the leading edge of the card.
O-Ring	A rubber ring used as a belt in several media driving applications.
OS (Operating System)	The instructions installed on the computer hard drive that run the computer's operations and applications. The driver used for any given OS will differ from other platforms. The correct version driver must be loaded for the Printer to interface with the OS and the application to print.
Output	Any product of the Printer including card image, encoded data and lamination.
Output Hopper	The portion of the Printer that accepts the completed cards.
Overlay	A resin-like substance that is transferred by the printhead to the card surface over a printed dye image to prevent image fading, increase abrasion durability and prevent dye migration.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Oversized Cards	Oversized cards are used for more efficient visual identification and are available in many non-standard sizes. The most popular sizes are CR-90 (3.63" x 2.37"/92mm x 60mm) and CR-100 (3.88" x 2.63"/98.5mm x 67mm).
Overlaminate	Protective clear or holographic material to increase security and durability applied over the printed surface with a hot roller.
(Thin Film) Overlaminate	A 0.25-mil thick resin material that enhances card security and durability applied over the printed surface with a hot roller. Available as clear or with embedded holographic-type security images.
Parallel	A method of data transfer in which serial data is divided into sections and sent simultaneously down parallel wires to speed transfer rate.
Parallel port	A communication socket on a device that allows for parallel data transfer.
PC (Personal Computer)	A stand-alone, programmable, electronic device that can store, retrieve and process data consisting of a CPU, mouse, keyboard and monitor.
PCB (Printed Circuit Board)	A solid, multi-layered plate on which electronic elements are attached, either through the board or on the surface.
Peel	The removal of a film or ribbon from a card surface (at a perpendicular angle) to ensure proper transfer, then separation, from the card surface.
Peel-Off	A bar on the lamination section that holds the film at the correct position and provides proper peel angle.
Peripheral	Any device that is attached externally to a PC. These often share the same data cable or port as a Printer and may be the source of communication problems.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Pinch roller	A free spinning (non-driven) roller that presses the card against the drive roller, on the opposite side, to ensure an adequate normal force for proper traction.
Pixel	Short for picture element. The smallest element of a graphic.
Platen	The hard rubber roller that drives the media through the Printer, providing support to the backside of the media during printing or laminating.
PET	Abbreviation for polyester terephthalate, often called polyester. Sheets of PET are laminated with sheets of PVC to produce thermal acceptance composite cards.
Port	A communication interface, serial or parallel, used for the transference of data.
PolyGuard Overlaminate	A 1-mil or .6-mil thick polyester material that enhances card security and durability applied over the printed surface with a hot roller. Available as clear or with embedded holographic-type security images.
Portrait	A document layout that is viewed with the document's long axis in a vertical orientation.
Potentiometer	An electronic resistor with a variable resistance value that can be mechanically set.
Print Driver	A software utility that serves as an interface between the Printer and the Windows GDI (Graphical Device Interface), making the Printer's functions available through the software application. It also provides the format information for the rasterizing of the print file including any necessary escape or function commands.
Print Job	A file of one or more cards for the Printer to print, including image data and Printer functions, transmitted through the parallel interface and at times stored temporarily in the print buffer and spooler.
Print Server	A device used to connect and control a Printer on a network.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Printhead	The device on a Printer that produces the image on the media.
PVC	Abbreviation for polyvinyl chloride, often called vinyl. PVC is the component of the 0.002" thick clear, dye receptive film on the surface of the identification card and is the primary component of the identification card cores.
Queue	A sequence of files or sets of data, awaiting transmission or processing.
Proximity (“Prox”) Card	Proximity cards allow access and tracking utilizing contactless technology, usually by communicating through a built-in antenna.
Prox Card Encoder	The Fargo prox card encoder uses an HID ProxPoint® Plus reader mounted on the e-card docking station inside the Printer/encoder. The ProxPoint is a "read only" device producing a Wiegand signal that is converted to RS-232 using a Cypress Computer Systems CVT-2232. Application programs can read information from HID prox cards via a RS-232 signal through a dedicated DB-9 port on the outside of the Printer labeled "Prox."
RAM (Random Access Memory)	A storage device for digital information to be held temporarily, to facilitate processing.
Rasterize	The process of converting the elements of a graphic into a bitmap to be printed.
Reboot	Cycling the power to the Printer so that it resets and reinitializes.
Registration	The quality of the alignment of the separate primary-color images: YMCK.
Resident Font	A set of characters loaded into the Printer memory that can be programmed to print those characters on the card without rasterizing the image.
Resin	A semisolid material.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Resolution	The number of individual pixel elements in a graphic, taken over a given length, used to indicate the sharpness of the picture and the level of detail. The number of elements in the printhead determines Fargo Printer resolution.
RFI (Radio Frequency Interference)	Electromagnetic waves radiated by poorly shielded cables or electronic devices that interferes with the operation or data transfer of another device.
RGB (Red/Green/Blue)	The three primary colors of the luminance or additive, model. Combinations of these three colors can produce practically all the colors of the spectrum that humans can detect. Computer monitors operate on an RGB model.
Ribbon	The dye impregnated film that is used for color printing.
Ribbon cable	Parallel wires held flat in a row by plastic insulation.
RibbonTraq	A Fargo Electronics method of placing bar code-like marks on the transition area between color panels. These marks are arranged for detection by a reflective Sensor array for the identification of ribbon type and the ribbon position.
RMA number (Return Merchandise Authorization number)	A number, acquired from Fargo Support, that authorizes the return of merchandise for repair or credit.
Roller	Elements of the Printer used for the transport of media consisting of a rotating steel shaft (for ribbon) or a rotating steel shaft with a rubber cylinder installed at the shaft midpoint (for moving cards).
RS-232	An interface standard, established in 1969 by the Electronic Industries Association, regarding the connecting of computer peripherals.
Saturation	A measure of the degree of color, from gray, with the same brightness.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Self-test	A pre-determined print file used to confirm Printer operation typically sent from the driver or stored in the Printer's memory.
Sensor	An electro-mechanical/electro-optical device used to indicate a change in state in the Printer such as when a card reaches a certain location.
Serial communications	The transfer of data, one bit at a time and in sequential order, using a single wire.
Serial interface	A sub D 9 pin input/output port on the Printer, used for serial communication with the PC for AS400 operating systems or for e card encoding.
SIMM (Single In-Line Memory Module)	An array of memory chips, attached to a printed circuit board that installs in a slot on the main board.
Simplex	Single-sided printing.
SmartGuard	An application from Fargo Electronics that allows users to prevent access to the Printer through the use of a personally encoded smart card.
SmartGuard™	SmartGuard is a Printer security option that uses a custom access card and a built-in reader to restrict Printer access. Only a valid access card can enable the Printer to print cards.
SmartShield™	This option allows the Printer to print custom, security images on the card that reflect under a black or UV light source.
Smart Card	Smart cards have an embedded computer circuit that contains either a memory chip or a microprocessor chip. There are several types of smart cards: Memory, Contact, Contactless, Hybrid (Twin), Combi (Dual Interface), Proximity and Vicinity.
Software	Instructions saved in computer memory that directs the computer to perform certain tasks and functions.
Spooler	A computer application that allows the spooling of print jobs.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Spooling	Rather than moving a print job directly to the Printer, the job is written to the disk so that the user can access the application faster while Windows takes care of printing in the background.
SS (Start Sentinel)	The character denoting the end of a magnetic data string.
Stacker	The device that moves the finished cards onto the output column ordering them "First In, First Out".
Stepper Motor	A Motor whose shaft turns in discrete steps, rather than continuously.
String	A sequence of characters that form a line of data.
Surface mount	A method of mounting circuit elements onto the surface of a circuit board, attached at solder pads, rather than through holes in the board.
Surge Protector	An electronic device, placed in serial to the Printer's power supply, that prevents damage to the Printer from electronic surges and electrical current that is outside of the normal parameters.
Switch box	An electromechanical device to which a user may connect several peripheral devices to the parallel port simultaneously, yet using the selector switch to designate the active port.
TAC	Thermal Acceptance Composite cards. Card stock produced by laminating sheets of PVC with sheets of PET for better thermal distortion resistance. Ultra III cards.
Temp file	A temporary file, generated automatically by Windows, to store the information for an active document. Windows should delete these files when the application is closed.
Test-print	A file stored in or generated through windows that is sent to the Printer to test basic functionality.
Thermistor	An electronic resistor on the printhead with a resistance value that varies in proportion to the heat to which it is exposed.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Thermocouple	A device for measuring temperature using a junction of two wires of dissimilar metals that produce a voltage when heated that varies proportionally with the temperature.
Through-hole	A method of mounting circuit elements with the leads passing through holes in the circuit board and soldered on the opposite side.
Timeout	An interruption of a print job that occurs when a function is not completed in the time allotted by the operating system.
TOF (Top of Form)	The leading edge of the card, as it travels through the Printer.
Track	The area on a mag stripe designated to contain the magnetic data string.
Troubleshooting	The process of investigating and determining the cause of a problem.
TrueType (TT)	A font format that produces each character using a mathematical equation, rather than a graphical representation, resulting in a much sharper, cleaner image.
UltraCard	The Fargo brand of card stock, recommended for use in Fargo Printers, with the necessary glossy surface and composed of PVC.
UltraCard III	The Fargo brand of card stock, recommended for use in Fargo Printers that laminate, with the necessary glossy surface and composed of PVC and PET to prevent heat distortion.
Update	The process of installing a new revision of software or firmware to implement new changes to the Printer's command codes and procedures.
UPS (Un-interruptible Power Supply)	An AC power supply, typically powered by batteries, which provides temporary power to the PC or Printer during an interruption of the supply voltage.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
USB (Universal Serial Bus)	A 1.5M/sec (12Mbit/sec) serial communication interface that can support 127 separate devices consisting of 4 wires: power, ground, data in and data out.
Virtual Memory	A technique used by Windows when chip memory is exhausted, in which data is written to the hard to hold data temporarily and support Window's operations.
Wrinkle	The appearance in the card image of wavy or arched lines, either colored or clear, caused by improper film or ribbon tension.
YMC	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C).
YMCK	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K).
YMCKH	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K), Heat Seal (H).
YMCKK	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K), Black (K) (the second K is for backside, black only printing).
YMCKO	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K), Overlay (O).
YMCKOK	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K), Overlay (O), Black (K) (used for backside, black only printing).

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